

STAMIGA

FORMAT

The complete package for Atari ST and Commodore Amiga owners

WHIRLY WIZARD



Whirligig heads the month's best games

ROBOTS!

How the ST and Amiga are tooling up for the future

PERFECT PROGRAMMING



New versions of C, Pascal and BASIC to motivate your micro

- **ATARI'S CD ROM**
Definitive review of the Big Disk
- **DELUXE PHOTOLAB**
The best ever Amiga paint program?
- **MUSIC MASTERS**
Get more from your synthesizer with sound editors
- **HINTS, TIPS & TRICKS**
What the manuals tried to hide!

**ST AMIGA
FORMAT
ISSUE 3
SEPTEMBER 1988**

PUBLISHED BY
FUTURE PUBLISHING LTD
4 QUEEN STREET
BATH

AVON BA1 TEL
Phone: 0225 608200
Fax: 0225 646095

CO-EDITORS
Ben Taylor
Simon Williams

**TECHNICAL
EDITOR**
Richard Montano

GAME'S REVIEWS
Andy Adams

**DISK
CO-ORDINATOR**
Jason Holburn

ART EDITOR
Gordon Drake

**ADDITIONAL
DESIGN**
Dean Wilson
Angela Peal

**ADVERTISING
MANAGER**
Helen Lawton
(01) 474 7330

PUBLISHER
Chris Anderson

**SUBSCRIPTIONS
MAIL ORDER**
Future Publishing Ltd,
The Cent Barn, Barnetons
Somerset TA1 7PY
0406 44001

PHOTOGRAPHY
Mark Jones & Son
Dorset, Dorset

POSTERS

Chris New-Olsen
Plymouth

DISTRIBUTION:
HBI Distribution, 9
Langham Court, Park
Barnetons (0406) 44001

© Future Publishing
Ltd 1988

ST/Amiga Format is an
independent publication
and has no links
whatsoever with Atari or
Commodore.

We welcome unsolicited
contributions from
readers. Please address
an BM with material if
you want it returned.
Payment for accepted
items is made 4 weeks
after publication.

No part of this magazine
may be reproduced in
any form without
permission.

ST AMIGA FORMAT

The complete package for Atari ST and Commodore Amiga owners



NEWS

Price cuts on the ST lead in the Christmas rush already?!, plus reports of hot new products from Euro-188 and the British Music Fax.



39



ROBOTS

Widely used in industry, and now under control of your friendly ST and Amiga, robots are not quite what they're made out to be in the movies.



ST PD

Find out what you can do with your ST without spending a penny. The best public domain software named.

71

DISK EXTRA

Test the best space races (Powerzone ST) and speed warrior hand steers (Amiga) head up this month's disk, plus a plethora of programs from the people who really count - you!



63

5



GOLD DUST

Steve Gold goes online for Format readers again with news of the SBC/28 ST, Deluxe/Plus II on the Amiga, and all the gilded goods.

88



SPECIAL OFFERS

More under the counter deals from the Format corner shop. Save pounds by shopping from these pages.

89



LETTERS

The agony and the ecstasy of life with a computer. Your questions answered and your musings scolded by the Format team.

94



ESCAPE SEQUENCE

The near end of the month, is more ways than one. All the news that won't fit to print printed to fit, and, of course, Superheroes.

98

GAMES



SCREEN PLAY

The games are really flooding in this month: Format Golds go to Space Harrier and Wipeout, plus first look at Maxis's new Imaginix label - Sky Chase on the Amiga.

45



GAME BUSTERS

You thought Amiga games couldn't be asked? Wrong! Inexpensive ingenuity in Starblaster, plus tons of tips for Flight Sim II, Leashmunks, Baron and Death March.

74

GRAPHICS



35



MASTER OF LIGHT

Nigel Bromwich is celebrated creator of the graphics on Memorex and Memoset - explains how he puts his masterpieces together.

REVIEWS



ATARI CD ROM 13

Bestest of the long-awaited CD-ROM drive from Atari.



PROGRAMMING LANGUAGES 17

What do you need to get the ultimate speed from your Atari? We check out new versions of Cather C, Pascal 3 and GFA BASIC.



DELUX PHOTOLAB 26

Electronic Art's answer to Photo Paint - could this be the best Amiga art package yet? Read our review and find out.



HOME ACCOUNTS 32

Digital's new ST package promises to save you its asking price - can it deliver?



TRIP-A-TRON 60

Jeff Miller comes up with his long-promised 'light synthesizer' for the ST. Give your mind a psychedelic experience it'll never forget.

WORK AND PLAY

Now that we've reached the grand old age of three months, that is, we're getting a good mixed bag of just what we need. Of all the suggestions for improving the magazine, the two most common are (a) drop all the boring business and programming stuff and just cover the games, or (b) drop all the kiddy games stuff and just cover the business and programming.

In a way, we half expected this. After all, the ST and the Amiga are the first true all-round home computers they've both got brilliant graphics and stunning sound for games, and they've got massive memories and high quality screens for the most demanding of business applications. There will always be people who don't realise how powerful the other half of the machine they own really is.

In the old days, you might have had an IBM PC to work on, alongside

a Sperry for a quick nap when you feel the need for light relief. Now one machine does the lot.

The vast majority of correspondents are delighted with the mix of serious and entertainment software in Format. People who bought their ST or Amiga purely to play games or are discovering how to tap its underlying power, and people who bought one as a specialist workstation - graphics, music or business - are discovering the joy of playing the best games written by top programmers the world over.

We've got a suggestion to solve the arms race in one fell swoop. It's simple really: give all leaders of the world governments an ST and Amiga each, and they'll be so busy swapping tips on their new discoveries they'll be too busy to do any harm. Brilliant! Why hasn't anybody thought of that before?

MUSIC



SOUND SHAPERS 28

Have synth will compose - but a little help doesn't go amiss. Chris Jenkins goes into the world of patch editors and how they link to a synthesiser.

TECHNOPHILE



LEARN BASIC 76

Part 2 of our teach-yourself series covers loops and conditions. Get stuck into Amiga BASIC or ST Power BASIC from last month's cover disk.



TECHIES' CORNER 79

Kumar's K4Gadget, Hoot's H4RC3 and other new programmers' tools come under the microscope, plus a selection of new books for assemblers, C and BASIC fans.



DESKTOP 83

Turn your computer inside out with these two pages devoted to helping ST owners.



WORKBENCH 86

A pot pourri of tips and tricks to squeeze the most out of your Amiga.





THE LEADING NORTH WEST
SPECIALIST ATARI DEALER



**LABROKE
COMPUTING**
INTERNATIONAL

33 Grosvenor Road,
Fleetville, Lanes, PR8 3DP
Tel: 0775 2474 (4 lines)
0775 30846 (4 lines)
Bulfinch (0773) 27236
9.00pm to 9.00pm

DEALER
INQUIRIES
WELCOME

HARDWARE

BUSINESS SYSTEMS

MSICA ST 2 £1034.99
MSICA ST 4 £1379.99
DTP SYSTEM £1629.99
DTP SYSTEM £13449.99
PCD 80 £689.99
PCD HD £1092.49
PCD DD £747.49

ST SYSTEM'S Success Pack

520 STFM + 1Mg internal
drive+joystick +over £400
of latest release software
for only £999
1040 ST's £480

While stocks last.

External Modulators for
the 1040 ST's £54.99

SMI234 Mono mon £139

SC1234 colour £275

Philips 8883 colour

monitor £299

T.V's and others phone

Any of above bought with a
computer Deduct £10.

COMMAN 1MG DRIVES

Why pay a little less for an
inferior second drive when
we can supply you with a
top quality Drive for only
£109.

PERIPHERALS

Triangle 1Mg drive £119
Psa Draw Tablet phone
Image Scanner £99
Mark Scanner £1050
CRP Tablets A4 £414
A3 £818

Atari 520 STM's phone for
Availability.

Commodore Amiga+3 soft-
ware Ultra+ Mouse. £399

MUSIC

We stock Music Software
and Hardware for the ST
including a range of ARAM
samples and synths. Suit-
able for Hobbyist and
Professional applications.
Come in for a demo of the
power and versatility of the
Atari Hardware.

PRINTERS

Star LC10 £225
Star LC10 Colour £275
Citrus LFM £199
MBC 2200 £375
Epson LQ280 £275
Star LC30/24 Phone
Epson LQ800 Phone
Gardner £199

SLM800 Laser £1350

The Atari SLM 804 In-

cludes a 90 day Warranty.

All Printers Come Com-

plete With Cables ETC.

Interfaces Are Separate.

DESK IDEAS

Atari 32mg £255
Super 32mg £255
Triangle 32mg £499
Triangle 48mg £699

UPGRADES

3.5 and 4Mg Upgrades are
available to fit the old 520
STFM boards only.

Upgrade boards £135

Boards + DRAM phone

1 Mg STFM (fixed) £195

1 Mg STFM Q30 £99

STFM Upgrade fitting

services £15

If any of the above Up-

grades are purchased with

Hardware then deduct £5

from total. Prices will be

held as long as possible.

Our Atari trained engineers

will repair all hardware in

minimum time at competi-

tive rates.

DESK CORDS

Computers £2.99
Monitors £4.99
Disk Drives £2.99
Hard Disks £4.99
Printers £7.99

SOFTWARE

SPELL AND ADD WITH ORCA £12.99 EACH

Spell teaches keyboard skills, spelling and motor coordina-
tion while Add teaches addition, subtraction, multiplication
and division.

QUICK LIST PLUS & MASTERMAY £6.99

Directory Database Compiler with customised format
and copy protect prog. on same disk.

AN ANIMATOR £34.99

Animated Graphics Tool for the ST. Supports GFA
and FAST Images. Compatible with DEGAS
and NEOCHROME files. Full Facilities such as Draw,
Fill, Grid Copy etc. Includes FREE basic routines
and demo prog.

PESTRIP £5.99

Full screen picture manipulation. Supports GFA, FAST
and ST BASICs. Compatible with DEGAS,
NEOCHROME and AN ANIMATOR. Check all or part of a
picture in all resolutions.

MAGNETIC MEDIA

3.5" DIS Q30			5.25" DIS D50 % TPI		
10	10+bs	100+bs	10	10+bs	100+bs
£14	£15.50	£140	£6.50	£8.00	£70

High Quality VHS Video Tapes.

Each £2.99 For 4 £11.40

For 2 £5.80 For 10 £26.00

All Disks are Top Quality SONY products and are covered
by an unconditional lifetime guarantee.

We also stock a full range of quality PRO ST Software at

£3.99 per Disk (discounts for Software club members).

Send S.A.E. for catalogue.

LABROKE COMPUTING SOFTWARE CLUB

Forget bargain hunting let Ladbroke Computing do the
bargaining for you.

For an annual membership fee of just £10 we will
GUARANTEE a saving to you the member of 15% off
MRRP (members only). We will also keep you up to date
on new releases in the Software and Hardware worlds
and of any special offers, up to 30% reductions, in the
future.

Please for Application form or write to address below.

TO ORDER: Simply send, or phone your order, stating full name, address, VISA or
ACCESS No's, Cheque or Money Order.

Make payable to:

LABROKE COMPUTING INTERNATIONAL. SEND SAE FOR FULL CATALOGUE.

Our mail order dept. gives the same excellent service to our customers as our premises at
the above address has done for the past 5 years. All Software will have been tested
prior to delivery thus ensuring that customers receive working items and the frustration of
returning faulty goods is now a thing of the past.

This kind of quality service does cost a little more but in the long run it is far cheaper.
All prices fully inclusive of VAT. Delivery, there are NO hidden extras. WYSIWYGL.
For next day delivery add £3. Prices correct at time of going to press and are subject to
change without prior notice.



Making a song and dance

STOS - The Games Creator* is a new BASIC-like ST programming language, specifically designed for producing graphics action games with. Written by French software house Jean International, the European rights have been picked up by Morden Software of glass cross Macintosh.

Usually for a games creation program, it seems that the major programming houses are very interested in using it. In the past, companies have seemed adventure creators like GIC and PINK, claiming they only produce very limited and simple games. In this case though, French software house Un Ball has already written two latest game Skate Ball with STOS, and are reportedly very pleased.

Among STOS's reported features are: moving up to 25 sprites on screen at once; adding an interrupt driven music beating track; recording predefined sound effects; compressing Degas or MacDraw graphics; colours; generating subroutines; menus; and scrolling up to 16 different scene areas independently.

The STOS package includes three sample games written with STOS: for you to examine, an icon editor, a quote editor, a character set editor, music editor and sports designer. Spreading over three disks, it comes in at £29.95.

■ Morden Software, Europa House, Arlington Park, Addington, Macclesfield SK10 5NP 0625-576880



■ The sports designer in STOS

PRICE WAR LEADS AUTUMN 16-BIT PUSH

It now seems almost certain that the price of the basic 520ST will drop to £299 in the Autumn, re-establishing its price differential over the Amiga. Paul Welsh, Atari's UK Marketing Manager, confirmed that details were being finalised on a follow-up promotion to the successful Summer Games pack, which offered £400 worth of high-quality games in the £299 ST price.

As of September 2nd 1989, Atari dealers will be offering two packages: a base 520ST at £299, or a bundled deal again of £1 plus around 4000-worth of games software at £299. Welsh commented, "We haven't tied up all the games yet, but I expect them to be of the same standard as the Summer Pack, which went very well." In other words, they will be repackaged recent hit price releases, not budget games.

Welsh added that Atari have earmarked £1.2 million for TV campaigns and advertising in the pre-Christmas period, and he expects to shift 70,000 STs. Official Atari figures say there are around 150,000 STs in the UK already, but independent estimates would put it at not much higher than 100,000.

Amiga assault

Commodore are responding by setting out their plans for a massive advertising campaign leading up to Christmas. Following the recent price cut to £299, the so-called 'Christmas deal' is run-



■ Welsh, looking to cut 70,000 STs in the pre-Christmas period

ning in the quality sales for the late summer ending the virtue of the A500. A four-week TV campaign is scheduled for the last two weeks in November and first two in December.

Dean Barrett, Welsh's counterpart in Commodore, was optimistic about the Amiga's autumn prospects. "We got no control over Atari's pricing policy, but we're putting our biggest ever push into this year," he said. "Last year we only spent a million or so, this year we'll be at least twice that with the bulk of the spend in the pre-Christmas period." The theme of the TV ads hasn't been finalised yet, but Barrett added candidly, "They won't be featuring the Chelsea football team."

The advertising campaign began two years ago by Apple to push its Macintosh as a specialist DTP system rather than a general-purpose computer is

widely credited with turning round the fortunes of the company. Commodore may well be hoping for a repeat of 'the Apple effect' by pitching its high-end A2000 range machines at specific vertical markets rather than as general purpose micros. It's no secret that Commodore are pulling together a desktop publishing package based around the Amiga, although so far the components haven't been named. A suitable minimum configuration system could be a twin disk drive A2000 running Professional Page, maybe with a high resolution monitor, at around £1500 including any printer.



Enabling word processing

Amos have released an updated version of their Protext word processor, v1.6, for the ST with several novel features. One which could be a lifesaver for disabled users is a new way of using the Shift, Command and Alt keys. Protext can be impossible if you don't have full use of both hands, so now you can

press [Control] first and then a, for example.

Other new features include the ability to redefine any character's screen appearance, and for the first time you can run GEM desktop accessories from within Protext. You can convert Protext files into Protext format, retaining all the embedded linking codes and so on.

Perhaps most useful is the 'Phrase/Insert record' mode - you can record any series of keystrokes and 'paste' them later on. Ideal for those repetitive editing chores.

Protext costs £79.95, or £15 if you are upgrading from a previous version.

■ Amos Protext Round, Ruislip Rd, Ruislip, Middx UB2 8NU (071 3 299311)



AMI-EXPO '88

A major event in the Amiga calendar took place in Chicago between 22nd and 23rd July - AmiExpo, the Amiga developers' showcase. Many Laser from The Amiga Centre Scotland went over to see all our new products.

Most exciting was perhaps the demonstration of the long-awaited Video Toaster from Newtek. The Toaster is an effects processor to produce Top-of-the-Range style results from your Amiga. You plug a video camera into it, and the Amiga can take the image, separate it into a sphere, flip it, split it, position it in 3D observation at its real time - that means as fast as the camera grabs the frames. Complete with a professional quality graphics, Newtek are selling at a price of under £1000* in the States. That sounds cheap, but professional graphics alone can cost £750, and real-time graphics workstations cost around £40000 at the moment. A PAL version suitable for the European market is under development.

On the even more expensive graphics side Newtek are taking over £3000 - you can't afford it, but cheap anyway! is a 34 bitplane colour scanner from ASDG. This can grab images in 16 million colours, and although the Amiga can't display them all, modern colour output devices such as 'teletext' colour laser printer can print them.

Two others from ASDG are *Cygnus II* Professional, a specialist programmer's text editor at £75, and the *Team-3* board. *Cygnus II* includes lightning fast scrolling, search at 500,000 characters per second, moving text blocks in vertical columns, multiple windows open to the same file, and an interface to the Amiga standard data interchange language. The *Team-3* board is a plug-in to the A2000 to allow you to attach industry standard hardware like barcode readers and Digital to Analogue converters. Sounds essential in hardware development.

Other smaller utilities on sale included an expansion rack for the A500 and A500X to give it slots for A2000 or PC-compatible expansion cards. *Fancy 3D Fonts* is a set of three specially designed fonts for *Scout3D* and *FontForge* 3D, going for £48.95; there's a *PostScript* version of the *ProFont* word processing package, for those of you



who own laser printers; and finally *WSP64* is a replacement for the standard CU which is a commercial development of the PG ComMan program. As well as being able to edit your last command lines, which the *Commander* WYSIWYG 1.3 release due in the Autumn will offer anyway, *WSP64* offers command aliases, resident commands the more twiddling steps to get a directory!! and the ability for CU users to 'post' data from the output of one program to the input of another between two tasks running concurrently, all in about 10K.

■ For further details about any of these products, contact The Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh EH8 8NN 031 447 4242.

Brief briefs

Timesworks Data Manager Professional is a new logical database package for all models of SE. It costs £69.95 from *Technic Distribution* 02934 81798, and claims relational database operation, fast sorting of data, a simple setup procedure and a custom word processor.

Kuma 0275751 4395 have revamped their *ST & Amiga* mail compression program. *Version 2* sells at £79.95, or a £30 upgrade to existing *K* Manual owners. Sales are displayed whenever during composing and adding up to 2000 words can be stored in 4-channel mode, which comes, in around 20 minutes playing time. Kuma version 1's file, GEM based and MUI compatible.

Digitel 0209 450949 are bringing their business PC and Amig software ranges to the Amig. Following *Digitel* business last month and *Home Accounts* this month, *Mailshot* and *Mailshot*

Plus £24.95 and £49.95 respectively are out to ease the burden of businesses doing direct mail operations.

Advanced Memory Systems - purveyors of the *DTF* Store Plans range on most home prices - have been bought up by the Swiss company *Logitech*. *Logitech* are major mouse producers, supplying the rodents for *Microsoft* Packard and others, and AMS used that mice in their own *DTF* packs. Acquiring AMS seems to be a move by *Logitech* to sell *DTF* kit directly, rather than go through distributors as before. How the deal affects the launch of *Amiga* Pack AMS's *ST DTF* addition, we'll get clear.

Data Manager PROFESSIONAL
A powerful multi-media management system



British Music Fair

Chris Jenkins battled his way through the maze at the Wembley Conference Centre and reports on the 1988 British Music Fair, where there was plenty to excite ST and Amiga owners.

Space 1999

Perhaps the best news came from the oddity-driven *MSX802X* (1999) to post most of the American *Dr. T* software range is to be launched on the Amiga. This includes *MSX*, the *Keyboard-Controlled Sequence* program, and a huge range of patch editors for the Roland *DX5/10/15/MT32*. Yamaha *DX5/10/15/MT32*, Casio *CE*, Kawai *KL*, and *Ensoniq ESQ1*, at around £150. There's also the musical score writing program *Composer*. The beginner's *Level 1* package costs £79.95, whereas *Level 3* at £299.95 supports laser printers, desktop publishing packages and alternative fonts. Was on the way is another range of Amiga patch editor/librarians from *Soundcraft*, including all the old favourites plus a generic librarian for a huge range of synths, with prices



SOFTWARE LIST

NAME	FORMAT	R.S.P.	OFFER PRICE
Amiga 500	Amiga 500	1999	1999
Amiga 500 Plus	Amiga 500 Plus	2499	2499
Amiga 500 Plus 2	Amiga 500 Plus 2	2999	2999
Amiga 500 Plus 3	Amiga 500 Plus 3	3499	3499
Amiga 500 Plus 4	Amiga 500 Plus 4	3999	3999
Amiga 500 Plus 5	Amiga 500 Plus 5	4499	4499
Amiga 500 Plus 6	Amiga 500 Plus 6	4999	4999
Amiga 500 Plus 7	Amiga 500 Plus 7	5499	5499
Amiga 500 Plus 8	Amiga 500 Plus 8	5999	5999
Amiga 500 Plus 9	Amiga 500 Plus 9	6499	6499
Amiga 500 Plus 10	Amiga 500 Plus 10	6999	6999
Amiga 500 Plus 11	Amiga 500 Plus 11	7499	7499
Amiga 500 Plus 12	Amiga 500 Plus 12	7999	7999
Amiga 500 Plus 13	Amiga 500 Plus 13	8499	8499
Amiga 500 Plus 14	Amiga 500 Plus 14	8999	8999
Amiga 500 Plus 15	Amiga 500 Plus 15	9499	9499
Amiga 500 Plus 16	Amiga 500 Plus 16	9999	9999
Amiga 500 Plus 17	Amiga 500 Plus 17	10499	10499
Amiga 500 Plus 18	Amiga 500 Plus 18	10999	10999
Amiga 500 Plus 19	Amiga 500 Plus 19	11499	11499
Amiga 500 Plus 20	Amiga 500 Plus 20	11999	11999
Amiga 500 Plus 21	Amiga 500 Plus 21	12499	12499
Amiga 500 Plus 22	Amiga 500 Plus 22	12999	12999
Amiga 500 Plus 23	Amiga 500 Plus 23	13499	13499
Amiga 500 Plus 24	Amiga 500 Plus 24	13999	13999
Amiga 500 Plus 25	Amiga 500 Plus 25	14499	14499
Amiga 500 Plus 26	Amiga 500 Plus 26	14999	14999
Amiga 500 Plus 27	Amiga 500 Plus 27	15499	15499
Amiga 500 Plus 28	Amiga 500 Plus 28	15999	15999
Amiga 500 Plus 29	Amiga 500 Plus 29	16499	16499
Amiga 500 Plus 30	Amiga 500 Plus 30	16999	16999
Amiga 500 Plus 31	Amiga 500 Plus 31	17499	17499
Amiga 500 Plus 32	Amiga 500 Plus 32	17999	17999
Amiga 500 Plus 33	Amiga 500 Plus 33	18499	18499
Amiga 500 Plus 34	Amiga 500 Plus 34	18999	18999
Amiga 500 Plus 35	Amiga 500 Plus 35	19499	19499
Amiga 500 Plus 36	Amiga 500 Plus 36	19999	19999
Amiga 500 Plus 37	Amiga 500 Plus 37	20499	20499
Amiga 500 Plus 38	Amiga 500 Plus 38	20999	20999
Amiga 500 Plus 39	Amiga 500 Plus 39	21499	21499
Amiga 500 Plus 40	Amiga 500 Plus 40	21999	21999
Amiga 500 Plus 41	Amiga 500 Plus 41	22499	22499
Amiga 500 Plus 42	Amiga 500 Plus 42	22999	22999
Amiga 500 Plus 43	Amiga 500 Plus 43	23499	23499
Amiga 500 Plus 44	Amiga 500 Plus 44	23999	23999
Amiga 500 Plus 45	Amiga 500 Plus 45	24499	24499
Amiga 500 Plus 46	Amiga 500 Plus 46	24999	24999
Amiga 500 Plus 47	Amiga 500 Plus 47	25499	25499
Amiga 500 Plus 48	Amiga 500 Plus 48	25999	25999
Amiga 500 Plus 49	Amiga 500 Plus 49	26499	26499
Amiga 500 Plus 50	Amiga 500 Plus 50	26999	26999
Amiga 500 Plus 51	Amiga 500 Plus 51	27499	27499
Amiga 500 Plus 52	Amiga 500 Plus 52	27999	27999
Amiga 500 Plus 53	Amiga 500 Plus 53	28499	28499
Amiga 500 Plus 54	Amiga 500 Plus 54	28999	28999
Amiga 500 Plus 55	Amiga 500 Plus 55	29499	29499
Amiga 500 Plus 56	Amiga 500 Plus 56	29999	29999
Amiga 500 Plus 57	Amiga 500 Plus 57	30499	30499
Amiga 500 Plus 58	Amiga 500 Plus 58	30999	30999
Amiga 500 Plus 59	Amiga 500 Plus 59	31499	31499
Amiga 500 Plus 60	Amiga 500 Plus 60	31999	31999
Amiga 500 Plus 61	Amiga 500 Plus 61	32499	32499
Amiga 500 Plus 62	Amiga 500 Plus 62	32999	32999
Amiga 500 Plus 63	Amiga 500 Plus 63	33499	33499
Amiga 500 Plus 64	Amiga 500 Plus 64	33999	33999
Amiga 500 Plus 65	Amiga 500 Plus 65	34499	34499
Amiga 500 Plus 66	Amiga 500 Plus 66	34999	34999
Amiga 500 Plus 67	Amiga 500 Plus 67	35499	35499
Amiga 500 Plus 68	Amiga 500 Plus 68	35999	35999
Amiga 500 Plus 69	Amiga 500 Plus 69	36499	36499
Amiga 500 Plus 70	Amiga 500 Plus 70	36999	36999
Amiga 500 Plus 71	Amiga 500 Plus 71	37499	37499
Amiga 500 Plus 72	Amiga 500 Plus 72	37999	37999
Amiga 500 Plus 73	Amiga 500 Plus 73	38499	38499
Amiga 500 Plus 74	Amiga 500 Plus 74	38999	38999
Amiga 500 Plus 75	Amiga 500 Plus 75	39499	39499
Amiga 500 Plus 76	Amiga 500 Plus 76	39999	39999
Amiga 500 Plus 77	Amiga 500 Plus 77	40499	40499
Amiga 500 Plus 78	Amiga 500 Plus 78	40999	40999
Amiga 500 Plus 79	Amiga 500 Plus 79	41499	41499
Amiga 500 Plus 80	Amiga 500 Plus 80	41999	41999
Amiga 500 Plus 81	Amiga 500 Plus 81	42499	42499
Amiga 500 Plus 82	Amiga 500 Plus 82	42999	42999
Amiga 500 Plus 83	Amiga 500 Plus 83	43499	43499
Amiga 500 Plus 84	Amiga 500 Plus 84	43999	43999
Amiga 500 Plus 85	Amiga 500 Plus 85	44499	44499
Amiga 500 Plus 86	Amiga 500 Plus 86	44999	44999
Amiga 500 Plus 87	Amiga 500 Plus 87	45499	45499
Amiga 500 Plus 88	Amiga 500 Plus 88	45999	45999
Amiga 500 Plus 89	Amiga 500 Plus 89	46499	46499
Amiga 500 Plus 90	Amiga 500 Plus 90	46999	46999
Amiga 500 Plus 91	Amiga 500 Plus 91	47499	47499
Amiga 500 Plus 92	Amiga 500 Plus 92	47999	47999
Amiga 500 Plus 93	Amiga 500 Plus 93	48499	48499
Amiga 500 Plus 94	Amiga 500 Plus 94	48999	48999
Amiga 500 Plus 95	Amiga 500 Plus 95	49499	49499
Amiga 500 Plus 96	Amiga 500 Plus 96	49999	49999
Amiga 500 Plus 97	Amiga 500 Plus 97	50499	50499
Amiga 500 Plus 98	Amiga 500 Plus 98	50999	50999
Amiga 500 Plus 99	Amiga 500 Plus 99	51499	51499
Amiga 500 Plus 100	Amiga 500 Plus 100	51999	51999

NEW RELEASES

NAME	FORMAT	R.S.P.	OFFER PRICE
Amiga 500 Plus 101	Amiga 500 Plus 101	52499	52499
Amiga 500 Plus 102	Amiga 500 Plus 102	52999	52999
Amiga 500 Plus 103	Amiga 500 Plus 103	53499	53499
Amiga 500 Plus 104	Amiga 500 Plus 104	53999	53999
Amiga 500 Plus 105	Amiga 500 Plus 105	54499	54499
Amiga 500 Plus 106	Amiga 500 Plus 106	54999	54999
Amiga 500 Plus 107	Amiga 500 Plus 107	55499	55499
Amiga 500 Plus 108	Amiga 500 Plus 108	55999	55999
Amiga 500 Plus 109	Amiga 500 Plus 109	56499	56499
Amiga 500 Plus 110	Amiga 500 Plus 110	56999	56999
Amiga 500 Plus 111	Amiga 500 Plus 111	57499	57499
Amiga 500 Plus 112	Amiga 500 Plus 112	57999	57999
Amiga 500 Plus 113	Amiga 500 Plus 113	58499	58499
Amiga 500 Plus 114	Amiga 500 Plus 114	58999	58999
Amiga 500 Plus 115	Amiga 500 Plus 115	59499	59499
Amiga 500 Plus 116	Amiga 500 Plus 116	59999	59999
Amiga 500 Plus 117	Amiga 500 Plus 117	60499	60499
Amiga 500 Plus 118	Amiga 500 Plus 118	60999	60999
Amiga 500 Plus 119	Amiga 500 Plus 119	61499	61499
Amiga 500 Plus 120	Amiga 500 Plus 120	61999	61999
Amiga 500 Plus 121	Amiga 500 Plus 121	62499	62499
Amiga 500 Plus 122	Amiga 500 Plus 122	62999	62999
Amiga 500 Plus 123	Amiga 500 Plus 123	63499	63499
Amiga 500 Plus 124	Amiga 500 Plus 124	63999	63999
Amiga 500 Plus 125	Amiga 500 Plus 125	64499	64499
Amiga 500 Plus 126	Amiga 500 Plus 126	64999	64999
Amiga 500 Plus 127	Amiga 500 Plus 127	65499	65499
Amiga 500 Plus 128	Amiga 500 Plus 128	65999	65999
Amiga 500 Plus 129	Amiga 500 Plus 129	66499	66499
Amiga 500 Plus 130	Amiga 500 Plus 130	66999	66999
Amiga 500 Plus 131	Amiga 500 Plus 131	67499	67499
Amiga 500 Plus 132	Amiga 500 Plus 132	67999	67999
Amiga 500 Plus 133	Amiga 500 Plus 133	68499	68499
Amiga 500 Plus 134	Amiga 500 Plus 134	68999	68999
Amiga 500 Plus 135	Amiga 500 Plus 135	69499	69499
Amiga 500 Plus 136	Amiga 500 Plus 136	69999	69999
Amiga 500 Plus 137	Amiga 500 Plus 137	70499	70499
Amiga 500 Plus 138	Amiga 500 Plus 138	70999	70999
Amiga 500 Plus 139	Amiga 500 Plus 139	71499	71499
Amiga 500 Plus 140	Amiga 500 Plus 140	71999	71999
Amiga 500 Plus 141	Amiga 500 Plus 141	72499	72499
Amiga 500 Plus 142	Amiga 500 Plus 142	72999	72999
Amiga 500 Plus 143	Amiga 500 Plus 143	73499	73499
Amiga 500 Plus 144	Amiga 500 Plus 144	73999	73999
Amiga 500 Plus 145	Amiga 500 Plus 145	74499	74499
Amiga 500 Plus 146	Amiga 500 Plus 146	74999	74999
Amiga 500 Plus 147	Amiga 500 Plus 147	75499	75499
Amiga 500 Plus 148	Amiga 500 Plus 148	75999	75999
Amiga 500 Plus 149	Amiga 500 Plus 149	76499	76499
Amiga 500 Plus 150	Amiga 500 Plus 150	76999	76999

SPECIAL OFFERS WHILE STOCKS LAST

NAME	FORMAT	R.S.P.	OFFER PRICE
Amiga 500 Plus 151	Amiga 500 Plus 151	77499	77499
Amiga 500 Plus 152	Amiga 500 Plus 152	77999	77999
Amiga 500 Plus 153	Amiga 500 Plus 153	78499	78499
Amiga 500 Plus 154	Amiga 500 Plus 154	78999	78999
Amiga 500 Plus 155	Amiga 500 Plus 155	79499	79499
Amiga 500 Plus 156	Amiga 500 Plus 156	79999	79999
Amiga 500 Plus 157	Amiga 500 Plus 157	80499	80499
Amiga 500 Plus 158	Amiga 500 Plus 158	80999	80999
Amiga 500 Plus 159	Amiga 500 Plus 159	81499	81499
Amiga 500 Plus 160	Amiga 500 Plus 160	81999	81999
Amiga 500 Plus 161	Amiga 500 Plus 161	82499	82499
Amiga 500 Plus 162	Amiga 500 Plus 162	82999	82999
Amiga 500 Plus 163	Amiga 500 Plus 163	83499	83499
Amiga 500 Plus 164	Amiga 500 Plus 164	83999	83999
Amiga 500 Plus 165	Amiga 500 Plus 165	84499	84499
Amiga 500 Plus 166	Amiga 500 Plus 166	84999	84999
Amiga 500 Plus 167	Amiga 500 Plus 167	85499	85499
Amiga 500 Plus 168	Amiga 500 Plus 168	85999	85999
Amiga 500 Plus 169	Amiga 500 Plus 169	86499	86499
Amiga 500 Plus 170	Amiga 500 Plus 170	86999	86999
Amiga 500 Plus 171	Amiga 500 Plus 171	87499	87499
Amiga 500 Plus 172	Amiga 500 Plus 172	87999	87999
Amiga 500 Plus 173	Amiga 500 Plus 173	88499	88499
Amiga 500 Plus 174	Amiga 500 Plus 174	88999	88999
Amiga 500 Plus 175	Amiga 500 Plus 175	89499	89499
Amiga 500 Plus 176	Amiga 500 Plus 176	89999	89999
Amiga 500 Plus 177	Amiga 500 Plus 177	90499	90499
Amiga 500 Plus 178	Amiga 500 Plus 178	90999	90999
Amiga 500 Plus 179	Amiga 500 Plus 179	91499	91499
Amiga 500 Plus 180	Amiga 500 Plus 180	91999	91999
Amiga 500 Plus 181	Amiga 500 Plus 181	92499	92499
Amiga 500 Plus 182	Amiga 500 Plus 182	92999	92999
Amiga 500 Plus 183	Amiga 500 Plus 183	93499	93499
Amiga 500 Plus 184	Amiga 500 Plus 184	93999	93999
Amiga 500 Plus 185	Amiga 500 Plus 185	94499	94499
Amiga 500 Plus 186	Amiga 500 Plus 186	94999	94999
Amiga 500 Plus 187	Amiga 500 Plus 187	95499	95499
Amiga 500 Plus 188	Amiga 500 Plus 188	95999	95999
Amiga 500 Plus 189	Amiga 500 Plus 189	96499	96499
Amiga 500 Plus 190	Amiga 500 Plus 190	96999	96999
Amiga 500 Plus 191	Amiga 500 Plus 191	97499	97499
Amiga 500 Plus 192	Amiga 500 Plus 192	97999	97999
Amiga 500 Plus 193	Amiga 500 Plus 193	98499	98499
Amiga 500 Plus 194	Amiga 500 Plus 194	98999	98999
Amiga 500 Plus 195	Amiga 500 Plus 195	99499	99499
Amiga 500 Plus 196	Amiga 500 Plus 196	99999	99999
Amiga 500 Plus 197	Amiga 500 Plus 197	100499	100499
Amiga 500 Plus 198	Amiga 500 Plus 198	100999	100999
Amiga 500 Plus 199	Amiga 500 Plus 199	101499	101499
Amiga 500 Plus 200	Amiga 500 Plus 200	101999	101999

THIS OFFER APPLIES ONLY TO WHILE
PRESENT STOCKS LAST
PLEASE CHECK AVAILABILITY

UTILITIES

PRICE PERFORMANCE			
Apple IIgs 128K (new)	128K	1249	12.49
Apple IIgs 256K (new)	256K	1449	14.49
Apple IIgs 512K (new)	512K	1649	16.49
Apple IIgs 1024K (new)	1024K	1849	18.49
Apple IIgs 2048K (new)	2048K	2049	20.49
Apple IIgs 4096K (new)	4096K	2249	22.49
Apple IIgs 8192K (new)	8192K	2449	24.49
Apple IIgs 16384K (new)	16384K	2649	26.49
Apple IIgs 32768K (new)	32768K	2849	28.49
Apple IIgs 65536K (new)	65536K	3049	30.49
Apple IIgs 131072K (new)	131072K	3249	32.49
Apple IIgs 262144K (new)	262144K	3449	34.49
Apple IIgs 524288K (new)	524288K	3649	36.49
Apple IIgs 1048576K (new)	1048576K	3849	38.49
Apple IIgs 2097152K (new)	2097152K	4049	40.49
Apple IIgs 4194304K (new)	4194304K	4249	42.49
Apple IIgs 8388608K (new)	8388608K	4449	44.49
Apple IIgs 16777216K (new)	16777216K	4649	46.49
Apple IIgs 33554432K (new)	33554432K	4849	48.49
Apple IIgs 67108864K (new)	67108864K	5049	50.49
Apple IIgs 134217728K (new)	134217728K	5249	52.49
Apple IIgs 268435456K (new)	268435456K	5449	54.49
Apple IIgs 536870912K (new)	536870912K	5649	56.49
Apple IIgs 1073741824K (new)	1073741824K	5849	58.49
Apple IIgs 2147483648K (new)	2147483648K	6049	60.49
Apple IIgs 4294967296K (new)	4294967296K	6249	62.49
Apple IIgs 8589934592K (new)	8589934592K	6449	64.49
Apple IIgs 17179869184K (new)	17179869184K	6649	66.49
Apple IIgs 34359738368K (new)	34359738368K	6849	68.49
Apple IIgs 68719476736K (new)	68719476736K	7049	70.49
Apple IIgs 137438953472K (new)	137438953472K	7249	72.49
Apple IIgs 274877906944K (new)	274877906944K	7449	74.49
Apple IIgs 549755813888K (new)	549755813888K	7649	76.49
Apple IIgs 1099511627776K (new)	1099511627776K	7849	78.49
Apple IIgs 2199023255552K (new)	2199023255552K	8049	80.49
Apple IIgs 4398046511104K (new)	4398046511104K	8249	82.49
Apple IIgs 8796093022208K (new)	8796093022208K	8449	84.49
Apple IIgs 17592186044416K (new)	17592186044416K	8649	86.49
Apple IIgs 35184372088832K (new)	35184372088832K	8849	88.49
Apple IIgs 70368744177664K (new)	70368744177664K	9049	90.49
Apple IIgs 140737488355328K (new)	140737488355328K	9249	92.49
Apple IIgs 281474976710656K (new)	281474976710656K	9449	94.49
Apple IIgs 562949953421312K (new)	562949953421312K	9649	96.49
Apple IIgs 1125899906842624K (new)	1125899906842624K	9849	98.49
Apple IIgs 2251799813685248K (new)	2251799813685248K	10049	100.49
Apple IIgs 4503599627370496K (new)	4503599627370496K	10249	102.49
Apple IIgs 9007199254740992K (new)	9007199254740992K	10449	104.49
Apple IIgs 18014398509481984K (new)	18014398509481984K	10649	106.49
Apple IIgs 36028797018963968K (new)	36028797018963968K	10849	108.49
Apple IIgs 72057594037927936K (new)	72057594037927936K	11049	110.49
Apple IIgs 144115188075855872K (new)	144115188075855872K	11249	112.49
Apple IIgs 288230376151711744K (new)	288230376151711744K	11449	114.49
Apple IIgs 576460752303423488K (new)	576460752303423488K	11649	116.49
Apple IIgs 1152921504606846976K (new)	1152921504606846976K	11849	118.49
Apple IIgs 2305843009213693952K (new)	2305843009213693952K	12049	120.49
Apple IIgs 4611686018427387904K (new)	4611686018427387904K	12249	122.49
Apple IIgs 9223372036854775808K (new)	9223372036854775808K	12449	124.49
Apple IIgs 18446744073709551616K (new)	18446744073709551616K	12649	126.49
Apple IIgs 36893488147419103232K (new)	36893488147419103232K	12849	128.49
Apple IIgs 73786976294838206464K (new)	73786976294838206464K	13049	130.49
Apple IIgs 147573952589676412928K (new)	147573952589676412928K	13249	132.49
Apple IIgs 295147905179352825856K (new)	295147905179352825856K	13449	134.49
Apple IIgs 590295810358705651712K (new)	590295810358705651712K	13649	136.49
Apple IIgs 1180591620717411303424K (new)	1180591620717411303424K	13849	138.49
Apple IIgs 2361183241434822606848K (new)	2361183241434822606848K	14049	140.49
Apple IIgs 4722366482869645213696K (new)	4722366482869645213696K	14249	142.49
Apple IIgs 9444732965739290427392K (new)	9444732965739290427392K	14449	144.49
Apple IIgs 18889465931478580854784K (new)	18889465931478580854784K	14649	146.49
Apple IIgs 37778931862957161709568K (new)	37778931862957161709568K	14849	148.49
Apple IIgs 75557863725914323419136K (new)	75557863725914323419136K	15049	150.49
Apple IIgs 151115727451828646838272K (new)	151115727451828646838272K	15249	152.49
Apple IIgs 302231454903657293676544K (new)	302231454903657293676544K	15449	154.49
Apple IIgs 604462909807314587353088K (new)	604462909807314587353088K	15649	156.49
Apple IIgs 1208925819614629174706176K (new)	1208925819614629174706176K	15849	158.49
Apple IIgs 2417851639229258349412352K (new)	2417851639229258349412352K	16049	160.49
Apple IIgs 4835703278458516698824704K (new)	4835703278458516698824704K	16249	162.49
Apple IIgs 9671406556917033397649408K (new)	9671406556917033397649408K	16449	164.49
Apple IIgs 19342813113834066795298816K (new)	19342813113834066795298816K	16649	166.49
Apple IIgs 38685626227668133590597632K (new)	38685626227668133590597632K	16849	168.49
Apple IIgs 77371252455336267181195264K (new)	77371252455336267181195264K	17049	170.49
Apple IIgs 154742504910672534362390528K (new)	154742504910672534362390528K	17249	172.49
Apple IIgs 309485009821345068724781056K (new)	309485009821345068724781056K	17449	174.49
Apple IIgs 618970019642690137449562112K (new)	618970019642690137449562112K	17649	176.49
Apple IIgs 1237940039285380274899124224K (new)	1237940039285380274899124224K	17849	178.49
Apple IIgs 2475880078570760549798248448K (new)	2475880078570760549798248448K	18049	180.49
Apple IIgs 4951760157141521099596496896K (new)	4951760157141521099596496896K	18249	182.49
Apple IIgs 9903520314283042199192993792K (new)	9903520314283042199192993792K	18449	184.49
Apple IIgs 19807040628566084398385987584K (new)	19807040628566084398385987584K	18649	186.49
Apple IIgs 39614081257132168796771975168K (new)	39614081257132168796771975168K	18849	188.49
Apple IIgs 79228162514264337593543950336K (new)	79228162514264337593543950336K	19049	190.49
Apple IIgs 158456325028528675187087900672K (new)	158456325028528675187087900672K	19249	192.49
Apple IIgs 316912650057057350374175801344K (new)	316912650057057350374175801344K	19449	194.49
Apple IIgs 633825300114114700748351602688K (new)	633825300114114700748351602688K	19649	196.49
Apple IIgs 1267650600228229401496703205376K (new)	1267650600228229401496703205376K	19849	198.49
Apple IIgs 2535301200456458802993406410752K (new)	2535301200456458802993406410752K	20049	200.49
Apple IIgs 5070602400912917605986812821504K (new)	5070602400912917605986812821504K	20249	202.49
Apple IIgs 10141204801825835211973625643008K (new)	10141204801825835211973625643008K	20449	204.49
Apple IIgs 20282409603651670423947251286016K (new)	20282409603651670423947251286016K	20649	206.49
Apple IIgs 40564819207303340847894502572032K (new)	40564819207303340847894502572032K	20849	208.49
Apple IIgs 81129638414606681695789005144064K (new)	81129638414606681695789005144064K	21049	210.49
Apple IIgs 162259276829213363391578010288128K (new)	162259276829213363391578010288128K	21249	212.49
Apple IIgs 324518553658426726783156020576256K (new)	324518553658426726783156020576256K	21449	214.49
Apple IIgs 649037107316853453566312041152512K (new)	649037107316853453566312041152512K	21649	216.49
Apple IIgs 1298074214633706907132624082305024K (new)	1298074214633706907132624082305024K	21849	218.49
Apple IIgs 2596148429267413814265248164610048K (new)	2596148429267413814265248164610048K	22049	220.49
Apple IIgs 5192296858534827628530496329220096K (new)	5192296858534827628530496329220096K	22249	222.49
Apple IIgs 10384593717069655257060992658440192K (new)	10384593717069655257060992658440192K	22449	224.49
Apple IIgs 20769187434139310514121985316880384K (new)	20769187434139310514121985316880384K	22649	226.49
Apple IIgs 41538374868278621028243970633760768K (new)	41538374868278621028243970633760768K	22849	228.49
Apple IIgs 83076749736557242056487941267521536K (new)	83076749736557242056487941267521536K	23049	230.49
Apple IIgs 166153499473114484112975882535043072K (new)	166153499473114484112975882535043072K	23249	232.49
Apple IIgs 332306998946228968225951765070086144K (new)	332306998946228968225951765070086144K	23449	234.49
Apple IIgs 664613997892457936451903530140172288K (new)	664613997892457936451903530140172288K	23649	236.49
Apple IIgs 1329227995784915872903807060280344576K (new)	1329227995784915872903807060280344576K	23849	238.49
Apple IIgs 2658455991569831745807614120560689152K (new)	2658455991569831745807614120560689152K	24049	240.49
Apple IIgs 5316911983139663491615228241121378304K (new)	5316911983139663491615228241121378304K	24249	242.49
Apple IIgs 10633823966279326983230456482242756608K (new)	10633823966279326983230456482242756608K	24449	244.49
Apple IIgs 21267647932558653966460912964485513216K (new)	21267647932558653966460912964485513216K	24649	246.49
Apple IIgs 42535295865117307932921825928971026432K (new)	42535295865117307932921825928971026432K	24849	248.49
Apple IIgs 85070591730234615865843651857942052864K (new)	85070591730234615865843651857942052864K	25049	250.49
Apple IIgs 170141183460469231731687303715884105728K (new)	170141183460469231731687303715884105728K	25249	252.49
Apple IIgs 340282366920938463463374607431768211456K (new)	340282366920938463463374607431768211456K	25449	254.49
Apple IIgs 680564733841876926926749214863536422912K (new)	680564733841876926926749214863536422912K	25649	256.49
Apple IIgs 1361129467683753853853498429727072845824K (new)	1361129467683753853853498429727072845824K	25849	258.49
Apple IIgs 2722258935367507707706996859454145691648K (new)	2722258935367507707706996859454145691648K	26049	260.49
Apple IIgs 5444517870735015415413993718908291383296K (new)	5444517870735015415413993718908291383296K	26249	262.49
Apple IIgs 10889035741470030830827987437816582766592K (new)	10889035741470030830827987437816582766592K	26449	264.49
Apple IIgs 21778071482940061661655974875633165533184K (new)	21778071482940061661655974875633165533184K	26649	266.49
Apple IIgs 43556142965880123323311949751266331066368K (new)	43556142965880123323311949751266331066368K	26849	268.49
Apple IIgs 87112285931760246646623899502532662132736K (new)	87112285931760246646623899502532662132736K	27049	270.49
Apple IIgs 174224571863520493293247799005065324265472K (new)	174224571863520493293247799005065324265472K	27249	272.49
Apple IIgs 348449143727040986586495598010130648530944K (new)	348449143727040986586495598010130648530944K	27449	274.49
Apple IIgs 696898287454081973172991196020261297061888K (new)	696898287454081973172991196020261297061888K	27649	276.49
Apple IIgs 1393796574908163946345982392040522594123776K (new)	1393796574908163946345982392040522594123776K	27849	278.49
Apple IIgs 2787593149816327892691964784081045188247552K (new)	2787593149816327892691964784081045188247552K	28049	280.49
Apple IIgs 5575186299632655785383929568162090376495104K (new)	5575186299632655785383929568162090376495104K	28249	282.49
Apple IIgs 11150372599265311570767859136324180752990208K (new)	11150372599265311570767859136324180752990208K	28449	284.49
Apple IIgs 22300745198530623141535718272648361505980416K (new)	22300745198530623141535718272648361505980416K	28649	286.49
Apple IIgs 44601490397061246283071436545296723011960832K (new)	44601490397061246283071436545296723011960832K		



around £200; and, from Intelligent Music, the Amiga version of *8*, a very powerful sequencer/ranger program originally for the Apple Macintosh.

New ST products coming through MCGEEK include *Finger*, a real-time variation generator at £80, and *Phantom*, a revolutionary package which generates and reads SMPTE video/frame synchronization code through the ST's serial port, fitted as a disk accessory with a sequencer package. *Phantom* could slot into £200-300 or SMPTE hardware.

Draw a tune

The most unusual new package is Intelligent Music's *MIDI Draw*, an ST package which allows you to translate mouse-controlled graphic sketches into MIDI data. Skiffs, volume and MIDI parameters can be printed, and performances can be saved as files which are compatible with other sequencers. Price is yet to be announced.

Another good lot of news is the launch of Pandora Technologies, a UK software firm producing ST patch editors which work as data accessories with all

the major sequencer packages. The ST3 packages work unusually quickly, come in a Multitool bundle, and work with the Yamaha DX7, Roland D50/110, and the new King M1 and Kawai K1. Another real gem in the pipeline is *Lablog*, an algorithmic composition tool. *Lablog* works using up to eight simultaneous MIDI tracks, composing music according to sets of simple instructions relating to chords, timings and events. *Lablog*'s music can be edited in real time, and it creates files which are incompatible with other Hybrid Arts sequencers. *Lablog* is not finished yet, but it looks fantastic and it's aimed at the budget market.

Sternberg's huge range of ST products centred with the latest version of the *Pro24* sequencer (35), and the *Eax*, an ear-training and music theory program aimed at the educational market.

Stylish Lynex

Last but by no means least, the Lynex sampler from Commander Electronics showed how it can outperform much more expensive samplers. Using special signal processing chips designed for creative guidance, the Lynex is a featureless 15-inch black box connecting to the ST's expansion port. Because it doesn't use as much of the ST's own memory, you can load any sequencer package you choose, and use it in conjunction with the Lynex's sampled sounds. And still control external MIDI devices.

The Lynex claims sampling

quality above that of Compact Disc, plus anti-aliasing routines which maintain the sound quality even when you transcribe over the full MIDI range. Prices start around £1500, which is about the same as conventional keyboard samplers that appear to offer lower quality and less expansion potential.



■ The Lynex sampler from Commander Electronics, desktop up to a 104000

JUNGLE DRUMS

Good news for owners of Oberheim's £1000 MIDI Digital Drum Machine. Rather than loading and saving patterns, songs and drum sounds using cassette, you can now use your ST. The original designers of the hardware have just finished a *Pattern Editor* package, which uses an on-screen grid system to create patterns, songs and sound files, then dump them to the MIDI via MIDI. The software will come with several ten sets of eight sound samples, and should cost around £60. Oberheim also announced new sound sets on tape, a range of budget effects pedals, and the *MIDIbox*, a cost-reducing digital synthesizer or an emulating £100



PROGRAMMING NEWS

Typically, of course, just as we feature on programming languages in this issue need to print, news of some exciting new releases reached the Format offices.

The whole truth

BASIC is a much-maligned programming language, despite being the most popular in the world. It may come as a surprise to you to learn that its creators, John Kennedy and Thomas Kurtz,

also think it's a bit of a bogey.

The reasons are simple. They originally designed a smooth, simple programming language which was then hacked around by hundreds of different computer designers to squeeze into their micro, with arbitrary extra commands being added whenever they were needed. Result: chaos.

To clear their names, Kennedy and Kurtz have designed *True BASIC* - what BASIC should have been, they say. This is now available from Precision Software for both ST and Amiga, price £69.95. True BASIC claims to offer:

Portability - programs written on one machine can be transferred to any other, even if they use graphics and mouse buttons.

Structure - constructs like IF-THEN-ELSE, SELECT-CASE, DO-WHILE and GOTO's, have been added into the language, together with proper support for procedures and separate modules.

Graphics support - commands

to draw circles, lines, text and other graphics shapes are part of the language rather than being left to each computer's designers to invent. Drawing is done on a grid - a graphics screen and the system converts it to your particular computer's coordinates.

Speed - True BASIC is a semi-compiled system.

C++ goodies

Good news and bad news for C programmers. The good news - Lattice, component compiler writers for ST and Amiga, have announced an Amiga version of the enhanced C++ language. The bad news - it costs \$500 and needs 1.5MB of memory.

The Lattice C++ system is a pre-processor that converts C++ code into conventional C for compilation. C++'s main feature is the addition of 'object-oriented' programming constructs into C's basic framework. One use of this is to define procedures which can take different numbers of arguments, or different types of arguments.

Also as the C front, UK-based Genetic Distribution have now got a new version, v3.0, of the celebrated Mark Williams C on the ST. We haven't been able to subject this to the rigours of the Format Laboratories yet, but it seems to be typically 10% faster and on average 20% smaller than other ST compilers.

- Precision Software, 8 Park Terrace, Worcester Park, Surrey TW20 7AT (01-335 7144)
- Lattice Inc - UK company Metacomex, 26 Portland Square, Islington N5 2BQ (01753 426781)
- Genetic Distribution, 8 Green Street, Billingham, Cambridge CB4 5JL (0223 412788)

True BASIC

A New Kind of Language From the Heart

John G. Kennedy
Thomas E. Kurtz

Upgrade your GFA BASIC & get £30 of FREE Software!

Power BASIC and HiSoft BASIC have grown to be the standard BASIC implementations for the Atari ST and now HiSoft has a very special offer for existing GFA BASIC 2 users

Buy Power BASIC directly from us for the regular price of £49.95 from 1/1/88, return your GFA BASIC 2 interpreter with your order and get a free copy of Saved! (worth £29.95), a free GFA-to-Power BASIC converter and a free mouse mat!

FREE when you upgrade from GFA to Power BASIC

GFA-BASIC converter

Converts GFA BASIC .LST files into Power BASIC. Remember to re-save your GFA BASIC programs as ASCII before returning your disk to us!

Saved! Package

Our invaluable disk accessory and utility package, including the Saved! disk accessory, reset-secureable RAM-disk, printer spooler etc.

HiSoft File Selector

Adds drive buttons, type-ahead and much more to the standard GEM File Selector

Mouse Mat

Showing the complete ST ASCII character set

offer only available direct from us, offer starts 1.9.88, expires 31.1.1989. Price is 1.9.95, 100% of Power BASIC is £29.95 and the special offer is not available

Power BASIC Features

- Integrated, fast, easy-to-use GEM editor
- Produces faster code than any other ST BASIC
- Compiles from memory to memory for fast development times
- Advanced language, based on world-standard Microsoft QuickBASIC 3
- Powerful Procedures and Functions including local labels, fully recursive
- More than 380 pages of English, black/white documentation with many example programs
- Complete access to GEM, AES and VDI
- Complete access to BIOS, BIOS & GEMDOS
- Includes joystick, mouse & sound commands
- Can produce stand-alone program files on disk for you to give away or sell! No royalties
- Supports short & long integers, single & double precision numbers and unlimited string size
- Line numbers optional
- Multi-statement lines & multi-line statements
- Easy access to Alert boxes, Menus & Windows
- You'll never outgrow it - access GDCOS, resource files, dialog boxes as your skills develop
- Made & Supported in Britain

See the great reviews in PCW June 88, Atari ST User June 88, ST Amiga Format July 88

Also Available: HiSoft BASIC

All the features of Power BASIC plus:

- Create your own disk accessories
- Stand alone .TTP compiler
- Easy access to machine code (via Deepcode!)
- Program profiling

The special GFA offer (see left) is also available when buying HiSoft BASIC which costs £79.95

HiSoft

High Quality Software

HiSoft, The Old School,
Greenfield, Bedford MK45 5DE

Orders: (0525) 718271, General: (0525) 718181

All prices include VAT and UK first class postage.
Export & Trade details available on request

Name:
Address:

- ☐ Please send me a Power BASIC, enclosed is £49.95.
☐ Also enclosed is my GFA BASIC 2 master disk & manual, please also supply Saved! and a mouse mat FREE!

Cheque/PO:

Access / VISA number:

Expires:

Signature:



FUTURE PERFECT?

A real appetite-whetter to the new games that'll be melting your mice in the next two months. Andy Storer orders an hors d'oeuvre.



VECTORBALL

VECTORBALL

Masterframe ■ Amiga ■ £24.95

Two drunks play a complete blend of catch-up, ritual and bowls on a choice of five contoured pitches in what sounds like quite an intense encounter. Super smooth scrolling of the mesh metallic surfaces ensure it'll look good live. Whether this kind of sport will make the Olympics in 2008 entirely depends on the Android Liberation Front.

SPEEDBALL

Imageworks ■ ST & Amiga ■ £24.95

The new one from the long lost Nimrod Brothers of 'Kool' fame. Set in Speed Dome it's another future sport's hit, this time including weaponry, in fact, dynamic jousting and tackling to blow the opposition away in very sporting two-player action.



SPEEDBALL

Put you and your sword against beautifully animated medieval backdrops featuring the first 3D fight simulator. As far as gameplay and graphics go this one will put Defender of the Crown back in the Middle Ages.

POLICE QUEST

Mediagene ■ Amiga ■ £29.95

This 3D animated adventure is based on an American cop's world of crime and punishment, murder and narcotics. Over 100 city streets and four highways provide the landscape for hot leads and high speed pursuits. Inputs including both full computer text and joystick control will hopefully make Police Quest more than just a shoot-out fantasy.

RED STORM RISING

Microprose ■ ST & Amiga ■ £ not announced

Regularly far more advanced than

Slant Sixteen, Microprose's previous sub-aquatic outing, Red Storm is in focus on the tactical operation of an American nuclear attack submarine in World War II waters. And I mean something! - I'll 'war tank' as the commander is to locate and destroy Soviet subs in the lower than Arctic base using your realistic simulation of onboard tone and weapons systems which include intelligent torpedoes.

OPERATION WOLF

Genax ■ ST & Amiga ■ £ not announced

This superior conversion of the Turbo number one computer will feature six levels of shooting action as you take on the role of a military man given the job of rescuing hostages from a war-torn land. No, it's not Desert but same jungle scenario in which enemy soldiers, armoured cars, choppers and tanks abound.



MAINFRAME



IRON LORD

Wet Draft ■ ST & Amiga ■ £24.95

As an apprentice knight, out to prove your bravery, loyalty and courage, you will have to prove your proficiency at archery, wrestling and swordplay. Once accomplished the real fun begins -



POWERDROME

MAINFRAME

Imageworks ■ ST & Amiga ■ £ not announced

Although we're being saturated with fixed 140 vector graphics at the moment, Mainframe looks like it could use all sorts for multi-surface object manipulation. We're talking fast, fast, fast in a game play to be based in the cyber-space of William Gibson's Count Zero. Since it'll probably be released around the same time as Electronic Arts' version of Neuromancer it looks as though we'll get more than our fair share of cyberspace.



IRON LORD

POWERDROME

Electronic Arts ■ ST & Amiga ■ £24.95

A futuristic jetracer simulation (see this month's ST cover detail) where you compete against four pilots from other galaxies in six races situated on different planets. You'll have to tune your Solid 3D racer for each planet's conditions as well as adjust its suspension position as you negotiate tracks featuring crusher gates, but robot ic pitfalls might make your task of winning Powerdrome a little easier. Along with Vectorball, this is the kind of Olympic action we all want.

ZYNAPS



ZYNAPS: the most imaginative sci-fi shoot-'em-up game yet, from Hewson. It has a combination of 140 possible story sequences to fire your imagination. Zynaps is a game constructed like a comic book, with three chapters and four episodes of mind-blowing action. Each part gets tougher until our hero faces the final battle. It's the battle to end all battles!

HEWSON

Hewson, 560 Milton Park, Milton, Abingdon, Oxon OX14 4RS.

Hewson Consultants Ltd

As part of our continuing programme of innovative software we are always happy to evaluate software sent to us with a view to publication.

ATARI ST Series £19.95
COMMODORE AMIGA £19.95



ATARI CD ROM

Does the thought of slipping the Encyclopaedia Britannica snugly into your pocket excite you? Richard Monteiro reviews Atari's long-awaited CD-ROM unit, the CDAR604, which promises to put Gigabytes of data within your ST's grasp.

£799 ■ All STs ■ Atari UK, Railway Terrace, Slough, Berks SL2 5BZ 05755 3334447

A CD-ROM is like a read-only hard disk with a track length of just under three miles, capable of storing over 500,000,000 bytes of data. Huge amounts of information can be stored on a disc no wider than a hardpan and whose information can be retrieved at speeds approaching those of hard disks. One thing has prevented this technology reaching home computer users sooner – price. Once again Atari's edge, Power Window The Price Is Right,™ etc., rings true: they have introduced a Compact Disc unit that plays both audio and ROM CDs for under £800.

The customarily chunky CDAR604 package comes in a streamlined box (similar in shape to the Mega's processing unit and Jaguar hard disk) with a lead for connection to the ST's DMA port, and CD and control software on 3.5" disk. The front panel boasts a power switch (use caution to reset the unit), a couple of LEDs indicating disc activity, a headphone socket, an open/close button for the disc tray, a pull-out remote control unit and a digital display. The remote is one of those sparsely populated, with just audio and volume, and DMA in and out, allowing through connection of other DMA devices like hard disks, laser printers and even other CD players.

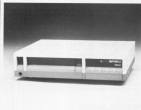
Computer data

CDs offer around 400Mb of storage, reduced to around 100 Mbytes if you opt for computer data. Usually, very is nothing to differentiate between ordinary audio CDs and computer CDs – the player works out the type of disc for itself.

When connected to the ST, the CD player acts like a high-capacity hard drive. In general, CD "seek time" (the time taken to find a file once the directory has been read) is similar to

early floppy drives (remember there are over 100Mb to search through rather than 100Kb) and transfer rate is faster than most hard drives, (15Kb per second). In practice it takes roughly two seconds to retrieve any piece of information.

Golan's Encyclopaedia, although Atari hasn't finished this yet. Software to access the CD drive is supplied on 3.5" disk, this is simply a ROM program, stored in the console of ROM, that allows you to extract data from the CD. Items can



be made for the theory, but how does the CD software and player interact with the OEM environment? Facts on File Inc's Visual French/English Dictionary was supplied with the review machine (real machines are likely to be loaded with

be searched for and then printed or saved as an ASCII file. The library can then be merged into other ASCII encoding programs.

The exact method in which data can be manipulated will vary from program to program. As the CD player

DIGITAL DEALINGS

If you want to be in with the CD crowd (and you best be) get up on CD speak. Following is a brief glossary.

Sample – a digital recording of a sound wave. The more bits of memory used to hold the sample, the better the reproduction.

Decoders – kind of today's CD players have 16-bit decoders (they can reproduce the original sample completely). Top-of-the-range decoders offer 18-bit resolution while the 16-bit manages very high quality (breaks only using only 1500s, but keeping the break-out equipment at top condition).

Inter-sampling – sample samples are fed to digital-to-analog converters (DAC) a number of times, then in four stages. This has the effect of increasing the maximum sampled frequency.

INNER WORKINGS

A Compact Disc, audio or ROM, is 1.2mm (at 9.5" in diameter and roughly 1.2mm thick, buried 1.1mm under a protective plastic coating lies a reflective layer studded with a fine spiral of pits. These pits represent sequences of binary digits (that is, either 0's or 1's). Each pit is 0.22µm in depth and 0.5µm apart with concentric rings of the spiral 0.8µm apart. This means that data is represented at 15,000 tracks to the inch – a whole heap more than standard 3.5" disks

(which offer 90 tracks per inch).

The data information is read by a laser beam produced from a gallium arsenide semi-conductor laser. An oval beam of near-infrared light is focused to a spot of 1µm in diameter. This spot is directed towards the disc's tracks and is reflected back if it hits a space or scattered if it hits a pit. Thus a change in the level of reflected light signals a transition from a pit to space or vice versa.

OPEN TO THE PUBLIC 10am-8pm 6 DAYS

If you wish to purchase any product from our list and find that you can buy the same product cheaper from another mail order company, simply enclose the lower amount, stating the name of the other company and where you saw the advert. (It must be the current issue). Price Promise does not apply to other companies' "Special Offers".

[illegible]

Please make cheques or postal orders payable to SDC
Price includes P&P within the U.K. Europe please add £1.50 (per disc)
Elsewhere please add £1.50 extra per tape

Please make cheques or postal orders payable to SDC.
Price includes P&H within the U.K. Europe orders add £1.00 per disc.

Eligible persons receive \$1.50 weekly per acre

**Top Quality 2nd Drives for the Amiga
and Atari ST at low, low prices**

Evesham Micros



- ✓ Offers full compatibility with all Atari II models, Amiga 500 and Amiga 1000
- ✓ Top quality Ciletti drive mechanism
- ✓ One megabyte unformatted capacity
- ✓ External plug-in PSU (Atari II)
- ✓ Throughput (Amiga)
- ✓ Very quiet
- ✓ Slimline design
- ✓ Colour matched to computer
- ✓ Long cable for location either side of computer
- ✓ Full 12 months warranty

Don't forget - all prices shown include VAT and delivery

**NEW
LOWER
PRICE**

£89.95

including VAT and delivery.

ATARI 500KPM SUMMER PACK!
Includes ETM2 with 1480 chips, 10 games, Control works! \$413.95 & up.
Circle 10

[illegible]

All ST prices include major tax. 2008 ST price is a non-including
morning, afternoon, evening, game and dinner.
We can arrange you for any combination of tickets.

PRINTERS

All prices include VAT, delivery and cable

Size	1.75 mm (0.069 in.)	0.0000
Weight	0.0000 g (0.0000 oz)	0.0000
Color	Black	0.0000
Material	Polycarbonate	0.0000
Finish	Matte	0.0000
Texture	Smooth	0.0000
Strength	High	0.0000
Flexibility	Low	0.0000
Durability	High	0.0000
Resistance	High	0.0000
Stability	High	0.0000
Compatibility	High	0.0000
Biocompatibility	High	0.0000
Recyclability	High	0.0000
Flammability	Low	0.0000
Toxicity	Low	0.0000
Corrosion	Low	0.0000
Wear	Low	0.0000
Impact	High	0.0000
Shock	High	0.0000
Vibration	High	0.0000
Humidity	High	0.0000
Temperature	High	0.0000
Pressure	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000
Mechanical	High	0.0000
Thermal	High	0.0000
Optical	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000
Mechanical	High	0.0000
Thermal	High	0.0000
Optical	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000
Mechanical	High	0.0000
Thermal	High	0.0000
Optical	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000
Mechanical	High	0.0000
Thermal	High	0.0000
Optical	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000
Mechanical	High	0.0000
Thermal	High	0.0000
Optical	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000
Mechanical	High	0.0000
Thermal	High	0.0000
Optical	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000
Mechanical	High	0.0000
Thermal	High	0.0000
Optical	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000
Mechanical	High	0.0000
Thermal	High	0.0000
Optical	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000
Mechanical	High	0.0000
Thermal	High	0.0000
Optical	High	0.0000
Acoustic	High	0.0000
Magnetic	High	0.0000
Electric	High	0.0000
Chemical	High	0.0000
Biological	High	0.0000
Environmental	High	0.0000
Physical	High	0.0000

3.5" Disks

10 disk packed 50000 31/2" disks	
with heads, fully guaranteed	\$11.00
20 built disks as above	\$22.00
10 disks as above with extra time	\$13.00
20 disks as above with 10 capacity	
volatile storage unit	\$24.00
Random Access Disk, no media, media	
with heads guaranteed, 1000 31/2" only	\$24.00
2000 31/2" only	

How to order from
Everyday Wireless



Please use with your
ACCESS or VISA
card details on :
see 0786-765200

and previous literature to the effect that the more the customer knows about the product, the more likely they are to purchase it.



☐ Send no longer. Please order
at 1-800-368-5868, send no longer

Check, when a PLC order arrives
Name Day depends whenever possible
all goods subject to availability, 0-14 days
Open to orders 4 days, 0-14 days

Evesham Mills Ltd
60 BRIDGE STREET
EVESHAM
WORCESTERSHIP
• 0382-765500
Fax 0382-765504
www.evesham.co.uk

Downloaded from ascelibrary.org by University of California, San Diego on 06/06/15. Copyright ASCE, For All Rights Reserved, No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage or retrieval system, without permission in writing from ASCE.



REVIEW

WATCH YOUR LANGUAGE

Programming languages bring out very strong feelings in people, especially programmers. The advantages of C over Pascal, Pascal over BASIC and BASIC over C promote a never-ending cyclical debate. Which one is right for you, and which are the latest contenders? Read on, find out, choose...

Once you've tried of Teresco, when you're weary of Word Perfect, when you've done steps by Degas you may start to wonder if there isn't more to life, and computing in particular, than running programs other people have written. What about writing your own? If you've tried using ST or large BASICs you'll know something of the problems and triumphs that programming can bring. There are plenty of languages other than BASIC though, each of which has its own advantages and drawbacks.

BASIC

The most popular programming language for novices, and unfairly maligned by those who haven't used modern versions, its advantages are its friendliness to the first-time user, its interactivity and its forgiving nature with errors. Antique BASICs like ST BASIC gave the language a bad name, being slow and hard to program. Later modern versions can be very good - often having compilers and structures like procedures borrowed from 'better' languages. BASIC is a good introduction, and the modern versions are suitable for compilation, but handling and graphics work, though they are normally not as fast as C or Pascal because they tend to be interpreted not compiled.

C

Increasingly the second most popular language, C claims to offer near machine-code speed without all the complexity of low-level programming. There's no doubt that C is fast, and many business programs are written in it for this reason; it is also very portable from one machine to another. C can be a little hard to understand at first, as its source code is not as self-explanatory as some more verbose languages. The structure of the language though, allows you to do almost anything you like with the

machine. Watch out for C's lack of error checking though. Obvious bugs can produce the strangest effects in C programs. It's a good, multi-purpose language.

Pascal

One of Pascal's main tenets is to produce very maintainable source programs; it also helps in rigid constraints to make you enter 'good' code. Pascal is only available as a compiler and is good if you like a language to check what you're doing. It is happy to throw up all kinds of error messages during compilation to let you know if syntax and program errors before you get near to running the code. Pascal is particularly good for writing long programs, as its imposed structure makes the source code maintainable. Its string handling is not as advanced as BASIC's, nor is its machine access as good as C's, though it has still been used to write word processors. Good compilers can produce code as fast as C.

Module 2

To some extent Module 2 is a rewrite of Pascal, but with a major change to its design philosophy - the idea of modules. As parts of a program are completed they can be stored in libraries and combined together into the finished program. Module 2 is the second of the micro programming languages, but compilers are available for both ST and Amiga and offer many of the advantages of Pascal with the bugs fixed too, dynamic strings, plus the development speed advantage of separate module compilation. Some modern Pascals have tried to get round this by adding modules to their compilers as an extra - cheat!

Assembler

Because compilers generate machine code by set formulas, high-level lan-

guage programs are rarely as fast as if you enter them directly in Assembler yourself. Assembler is very hard to write because it takes you 10000 lines to do what 1000 lines of C would do, and any mistakes usually cause an instant machine crash! If you need really fast code, most languages let you write the critical sections in Assembler and leave the rest in C or whatever. Most business programs are written in a high-level language, most games are still done in Assembler because that's the only way to get really fast graphics in the smallest possible space.





And the rest

There are of course dozens of other languages with their fans. **Fortran** is quite different in design from most other languages. It's written in an assembler-like mnemonic form, and works with a "stack" of numbers rather than providing variables in the conventional way. It also uses "Reverse Polish notation", which is like adding numbers' backgrounds. It's hard to get the hang of at first. **BORL** is a historical oddity when Commodore launched the Amiga, their plan for the operating system fell through at the last moment, and they bought in an adaptation of the Cambridge University "Impco" operating system, which happened to be written in

BORL. C is a later derivative of BORL. **Prolog** and **LISP** are two "radical" intelligent languages good at splitting sentences up into nouns, verbs, etc., and of course **Quattro** is the new simple processing language for controlling transactors.

So which one's for you?

As always, and without wanting to copy out, the final choice of language must be your own. You should look at the particular language you want to write and analyse the features that will be most important to you. Don't dismiss BASIC as the language others would have you do - the friendly development environment it offers is a real

help. If you want to sell programs you'll need a BASIC system with a compiler, to be able to generate standalone programs that don't need the interpreter on that line. If you intend to write complex games, multi-line searching or graphical applications, consider making the extra investment of time in learning GEM/Assembler for general applications. C seems to be far and away the most popular language at the moment, and so has the best support: the Amiga technical manuals give all their examples in C, for instance. If there are going to be too different programming, you may find the structure of Pascal makes the code simple to integrate and debug.

COMPILER COMPANION

Lattice also created a "Compiler Companion" kit with two disks to help programmers in other groups - Pascal, C, assembler, the lot. If you're used to a GEM environment this kit will make you feel at home. GEM and SPAT (support the compiler files, EDITACT and FILE.COM) both files. It's the source, GEM (source) for test in files, LMK and TOUCH (files) type editors to test some files, keeping source and object files in files. It's (source) and (source) is a C-compiler source for test in your compiler test.

If you're writing really big systems with dozens of modules, or use an assembler and GEM you'll find this very useful. It's a good idea to get a copy of the kit for your system. And it's (source) for your system.



Lattice C 4.01

All Amigas
2 drives recommended
£115 (standard), £215 (developer)
■ IBM/PC Compatible

Lattice Systems in the States have a pretty good reputation for selling robust programming tools, and it's no surprise that their Lattice C has become a standard. Version 4 is a major overhaul of version 3 (students of number theory should not be too

surprised at that), and continues the endless struggle for faster left shift or code.

The package comprises four disks, of which two are necessary for the basic sequence and general compiler operation. The first two disks are a collection of utilities, examples, header files and other goodies. The boot disks have been very well set up, so there is almost no installation needed. And back the disks up and meet your Amiga. All the logical elements are accessible for you so that the compiler and linker will find the libraries without you worrying about path names. The only exception is that

there are no printer drivers in the boot disk, which makes printing your first thing very hard work.

Also included in the boot sequence are two PD utilities, ComMan and PopGUI. ComMan modifies the CLI so that you can retrieve and edit your last few command lines - invaluable when later commands specifying half a dozen libraries can stretch to two lines - and PopGUI lets you open a new GUI window at any time by pressing AmigaAlt - equal to invaluable when your program crashes and you can't type any commands. It goes without saying that it is assumed if you are foolish enough to

LATTICE C ON THE ST

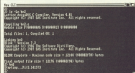
IBM PC ■ METACOMP ■ RELEASE DATE: 7/8/88 ON TWO 5.25 DISKS
IBM-based Metacomps have done a focused reimplementation of Lattice's Amiga code on the ST, but as yet this is still the older version 3 system. However, the way of re-implementing them may mean extra extra extra extra for the system up to Amiga (re-implementing) 4.01.

As the ST has no standard test editor, Lattice comes with a simple one. It uses GEM menus and conventions, but is hardly inspiring. It's a stand-alone editor, so there is no integrated error flagging from the compiler. It's just about feasible to run Lattice C on a single drive ST (double sided drives) but it helps if you've got a 10MB or Mega and can run a RAM disk up.

There is a "trace shell" option to give you a rough and ready edit-compile-debug line run environment. A "Break" utility helps you bring your object and source files to view. Lattice the Amiga Lattice C, there is no GEM/Assembler provided. An extremely useful symbols debugger is provided, which allows you to trace your program's execution step-by-step, print out the contents of named variables, and otherwise spot your programming errors at run time.

If you don't specifically open a GEM window, standard output goes to a simple TUI text screen, and control returns to the GEM desktop when the program finishes (helping your output off the screen).

Overall, it's an excellent system for the serious programmer, providing very efficient code, but it doesn't make too many efforts to be friendly to novices.



■ Lattice C on the Amiga has a very simple compile-and-link command: 'cc -O' but does it all for you for the file (BASIC) in the case.



■ AmigaBASIC gives you a nice friendly environment where you can see the program's code and output in separate windows. Debugging isn't easy with a compiler.

NEW DISC PRICES

3 $\frac{1}{2}$

Lifetime
Guaranteed,
double sided,
double density,
100 TPI, bulk
wrapped discs
with labels

Quantity	Price
10	£8.99
20	£17.99
25	£22.25
50	£43.99
100	£84.99

5 $\frac{1}{4}$

Lifetime
Guaranteed,
double sided,
double density,
40 TPI, bulk
wrapped discs
with labels

Quantity	Price
10	£3.50
20	£6.50
25	£7.99
50	£15.50
100	£31.00

NEW DISC PACKAGE DEALS

3.5 inch

40 discs + 40 cap. box	£39.99
80 discs + 80 cap. box	£74.99
120 discs + 120 cap. box	£114.99

5.25 inch

50 discs + 50 cap. box	£17.99
100 discs + 100 cap. box	£34.99
140 discs + 140 cap. box	£45.99

LOCKABLE DISC STORAGE BOXES

40 capacity	£5.49	50 capacity	£5.49	
80 capacity	£7.49	100 capacity	£7.49	
120 capacity	£9.99	140 capacity	£9.49	
Plastic Storage Box - holds 10 (state 3.5" or 5.25").....				75p

AT LEAST 30% OFF ALL 16 BIT SOFTWARE

ALL PRINTERS NOW WITH FREE BOX OF PAPER

**BRANDED DISCS - SONY, TDK, VERBATIM, DYSAN 3.5" DISC
FULLY GUARANTEED MEDIA - BEST PRICES IN UK!**

HARDWARE

AT LEAST 10% OFF ALL HARDWARE

COMMODORE AMIGA A500 with 10 discs + mouse mat	£369.99
ATARI - NEW 520 STFM Summer Pack Plus 10 Disc + M.mat	£369.99
EPSON LQ-500 24 pin letter quality printer	£349.99
CUMANA 1Mb Disc Drive, State Atari/Amiga + 5 blank discs.....	£109.99
* ALL COMPUTERS WITH VIRUS KILLER DISC *	

P&P Free on all orders over £15, under £15 add 75p P&P (UK only)
Overseas disc orders, add £3 P&P.
All prices include VAT!

Cestrian Software

52, Brook Street
Chester CH1 3DN
Phone 0244 312666
CALLERS WELCOME



UNBEATABLE PRICES

DEVELOPERS EXTRA

So what do you get for the extra \$100 investment in the Developer's version of Lattice C? The first thing is a decent text editor, so you can throw in-out the various C files - Edit. Also provided is Metacomco, a symbolic debugger to help you trace program execution, a "Main" ability to keep libraries of modules up-to-date, and a few test utilities. All very useful, not to say essential, to serious programmers, but you could help feeling they ought to be in the standard package, especially as they arrive free of charge.

write C you are so fat with the Amiga's GUI - so cuddly Windows looks fast, really.

So you come to writing your first C program. One major annoyance from the standard Lattice version is a text editor. Either you fork out the extra \$100 for the developer's version (see margin table), or you use the Amiga's very own ED.

Easy as A, B, C

Compiling a program is made as simple as possible. To compile and link a file TEST.C into a runnable program you would just type `CC -L -run TEST`. The resultant file TEST can be run as a standalone GUI command. You can compile and link separately if you want to - the linker is version 7.3 of the PS BLINK linker - and you can also run only the first pass of the compiler, to check for syntax errors in long programs.

The compiler's error trapping is a bit mixed, in general the line numbers it gives are very accurate - error on line 115 really means line 115 - but it is susceptible to spurious line-on errors. For example, on one test file we missed a `++` command terminator off, resulting in a "illegal macro usage" 100 lines later! It is very good at giving warnings that can reveal bugs,



LATTICE C
LATTICE C DEVELOPMENT SYSTEM
METACOMCO

such as using uninitialised variables, or misplaced semicolons in if statements that mean control can never reach a certain line.

Speed 'em up

Compilation speed and link time have been greatly improved over version 3. Code sizes have generally shrunk by 20%, but are now up to final code in size. Libraries have been re-organised by a factor of 5, but on simpler arithmetic you won't notice much change. 16-bit integers are now properly supported, some common string functions that are usually library calls are now built in to save space in the final code, and the linker can now handle true overlays for those really shaggy programs.

One nice option is the ability to specify whether code is to go into fast or Chip memory - this is handy for graphics programming as the Amiga's screen buffers can only access the 512k of Chip memory, if

you're of a mind to write 68000 code you can't include it unless it is a C source file. However, an AtariMate is provided with the package, and you can of course link assembled modules in with C code.

The Lattice manual is good enough, and documents the various C library routines pretty well. Small code fragments tell you what particular files you need, and show you the gist of the usage. Regrettably there is hardly any attempt to explain syntax in AmigaDOS - you're left to plough through the standard POSIX Kernel manuals yourself. There ought to be some extra libraries of single 'types/variables' commands to aid novices.

Lattice C version 4.1 is undoubtedly capable of producing superbly compiled code. Programming in C is where the action is, by popular vote, and the serious programmer who needs efficient code and detailed machine access will take a long time before leaving Lattice C.

Features

performance

ease of use

manuals

format

value

editor and debugger

universally acknowledged for novices

should come as standard

universally acknowledged for novices

editor and debugger

universally acknowledged for novices

should come as standard

universally acknowledged for novices

for

- Simple installation
- Easy compile and link commands
- Fast, compact code
- 68000 assembler included

against

- Editor and debugger should come as standard
- Universally acknowledged for novices

MCC PASCAL 2

Amiga version reviewed, \$2 version also available
£80.00 ■ Metacomco

There can be few who doubt the connection between the modular company Metacomco and the Amiga - AmigaDOS, the computer's multi-tasking operating system was written by Metacomco. Despite the pre-eminence of C for system programming, there is still a need for Pascalising Amiga owners, and Metacomco released MCC Pascal to provide them with the same system-level access as C. The new version, Pascal 2, has been considerably

improved, with many new features and a good few 'problems' fixed.

New features

There are a number of additions to the original version of MCC Pascal, the most significant of which is the ability to compile separate modules which can be linked together after compilation to produce a finished program. This means that once a portion of code has been written and satisfactorily debugged, it can be combined with further code without having to be recompiled again.

This technique speeds compilation of large programs, which can now be sub-divided into several small

or modules, and lets you build up your own library of commonly used procedures to incorporate into your programs. MCC Pascal handles modules via three new keywords: `MODULE`, `IMPORT` and `EXPORT`. `MODULE` is used instead of the keyword `PROGRAM` to head a source module, and `IMPORT` and `EXPORT` are used to declare procedures or functions within the module and programs so that they're prepared to link with each other.

Dynamic things are now supported, along with functions including `CONCAT`, `COPY`, `DELETE`, `INSERT` to manipulate them. Standard Pascal only considers fixed length arrays of characters and leaves you to write

your own functions to handle them. The new facilities certainly make life a bit easier.

Random access files are now supported too, so programs such as databases or accounts packages are much easier to implement. New keywords are introduced to handle various access files, and include facilities to return the current position of the file pointer and to reposition it to a defined record.

Other useful additions to the language include bitwise operations to manipulate bits within bytes, GOTO in the FOR structure and OTHERWISE in CASE statements. There are even GOTO and FOR statements (Shouldn't it be - GOTO, though quite what use these have on an Amiga is not clear. Expect a fairly heavy mail to the Goss if you use them liberally).

Edit, compile, link, debug

The process of program development follows a cycle of editing, compiling and linking to offer program mod-

GREEK, LATIN, PASCAL AND C

The first computer program ran at Manchester University on June 21st 1948. This was effectively written in binary: the operators worked out which bits of each word applied to be on or off, stored a few numbers on the first page, and set things going. As a result, only the machine's designers could actually program it. The first 'language' was assembler. A clever student decided to write a program that would read a file of short instructions ('mnemonics') as memory-juggling abbreviations and convert it into binary automatically.

In 1954, John Backus got fed up with being patronised by physicists to write programs for them, and decided to devise a system to let people write their own programs without intimate machine knowledge.

Fortran (Formula Translator) was the result, compiling its first program in 1957 on an IBM 704 computer. The business-friendly extension of low Fortran had allowed more scientists to write programs - developed COBOL (Common Business Oriented Language) in 1959. Between them, Fortran and COBOL still dominate the world of programming, to the regret of many.

About the same time, one end of the 60s, the students struck back, John Backus, realising his mistakes in FORTRAN, helped design Algol in 1958. This brought the concept of procedures, local variables and recursion into the world, and at

least is very similar to today's Pascal. John Backus (no relation) developed LISP in 1960, still regarded today as an writing language for artificial intelligence work.

The 60s saw a split in the language world, some people going for complexity and others for simplicity. In 1964, the Algol team met to rework the language. They talked things up, wrote features into it, and one academic, the Swiss Niklaus Wirth, was so frustrated by the result he went off and designed a really simple teaching version of Algol, called Pascal. Familiar? Ten years on, he has redesigned it as a teaching exercise, turning Pascal into Modula-2. Also in the spirit to make programming simple, Kenney and Korth invented BASIC in the same 60s.

In 1971, a Cambridge academic designed a simple language called BCPL (the inventor, Martin Richards, says that the CPL did stand for 'Cambridge Programming Language, but he lost one whether the B stands for Basic or Beginners.) This achieved worldwide obscurity, until Richards (Richman and Richards modified it to become the language B, then a new version called C) in 1973. By an accident of history (the Cambridge 4044 students were disorganised), BCPL was also the language chosen to write the design's operating system.

METACOMCO PASCAL

Ed. by
1985

Software for the AMIGA

and, using your editors and re-editing. The quicker and easier the environment (editor, compiler and linker) can make this process, the more useful the system will be, and the more programmers are likely to use it. Metac Pascal handles the compilation part of the cycle, leaving you at the hands of a 12 for your editing and left to your own devices for the logic errors.

The compiler that is hooked from the GUI and the linker can be called to follow on behind, automatically. It would have made life a lot easier to have an integrated editor-compiler which could bring you back to the source when compiler errors are discovered. The linker is the old faithful ALINK as on the Amiga master disk (apparently written by Alan at Metacomco, hence V LINK). The best way of setting up the compilation process, particularly when specifying paths to the source or object files, is as a command file. This can be written in ED and then CALDEXIT to call

the compiler.

Compilation is reasonably fast, though a program of any complexity is likely to make many calls to the library routines, more of which later. The compiler and libraries are fairly compact, so you can get the lot on a single disk, or it's therefore feasible to run Metac Pascal from a single drive machine. (Overall the compilation/link cycle is fairly long winded, which is quite an extra burden on the programmer to get the code right first time.

Library routines

Metac Pascal is a specific implementation for the Amiga, and its such contains internal function calls for nearly all the low-level ROM kernel routines. This is fine for the system programmer, who is prepared to wade through the ROM kernel manuals and wade through the contents (only a lot of the calls is provided in the Metacomco manual, but is not really adequate for application programmers).

The person who needs to put together a program for an end user doesn't want to get involved with the Metac Pascal implementation or really try to code. By all means provide these routines for those who want to build the Amiga's internals, but also supply something more like a 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

ERROR NUMBERS

There are three main types of error in programming with a compiler. Consider errors are picked up by the compiler while the actually compiling your program. These include syntax errors, undeclared variables, and so on. Run time errors occur when you start a variable (constant) program about contains things like division by zero or square rooting negative numbers. Getting a program starts the first type, and usually the hard bit to spot, are errors in the program logic, then the program executes the code you wrote, but what you wrote was not what you meant.

for

- Separate compilation to facilitate modules
- Random access file handling
- Extensions for dynamic string handling

against

- No high-level extensions to facilitate Amiga applications
- No integrated editor/debugger environment
- Complicated compile/link setup

features

1 2 3 4 5

performance

1 2 3 4 5

ease of use

1 2 3 4 5

reliability

1 2 3 4 5

format value

1 2 3 4 5

format value

1 2 3 4 5

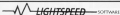
format value

1 2 3 4 5

format value

1 2 3 4 5

format value



14000 MAGNUM, BRYNOL, ST1 1 3AF
TEL: 0270-226604

24 HOUR ANSWER PHONE FOR ALL ORDERS
NEW TITLES AVAILABLE FROM DAY OF
RELEASE FOR ST AND AMIGA.

ATARI

Behavior Progress	20.00	Cutout	12.00
Box War	10.00	Flower	12.00
Castle Battle	10.00	Flora	7.00
CHD 20	20.00	Power Base	20.00
Caplan Wood	10.00	Pro Sound Design	40.00
Center Command	10.00	Protest 1.0	27.00
Chess Battle	10.00	Pro Light	10.00
Cross Road	10.00	Pro Mail	10.00
Cyber Study	20.00	Protest 2.0	10.00
Demarcus	10.00	Protest 3.0	10.00
Demarcus	10.00	Protest 4.0	10.00
Demarcus	10.00	Protest 5.0	10.00
Demarcus	10.00	Protest 6.0	10.00
Demarcus	10.00	Protest 7.0	10.00
Demarcus	10.00	Protest 8.0	10.00
Demarcus	10.00	Protest 9.0	10.00
Demarcus	10.00	Protest 10.0	10.00
Demarcus	10.00	Protest 11.0	10.00
Demarcus	10.00	Protest 12.0	10.00
Demarcus	10.00	Protest 13.0	10.00
Demarcus	10.00	Protest 14.0	10.00
Demarcus	10.00	Protest 15.0	10.00
Demarcus	10.00	Protest 16.0	10.00
Demarcus	10.00	Protest 17.0	10.00
Demarcus	10.00	Protest 18.0	10.00
Demarcus	10.00	Protest 19.0	10.00
Demarcus	10.00	Protest 20.0	10.00

All prices are inclusive of VAT and delivery inside the UK.
Please make cheques P.O payable to
"Lightspeed Software"
all orders despatched within 24 hours, please allow 7 days.

Introducing PROTEXT for the ST and Amiga

Atari's esteemed WORD PROCESSOR has now been implemented
for the Amiga and ST computers. These are not cheap conversions
but individually crafted programs designed to take full advantage of
these powerful 16 bit machines.

ST user described Protext as:

"Probably the most powerful word
processor in the Atari ST and quite likely
to become the best-selling text..."

"Every feature you could possibly want is
here - word processing, text and table editing,
mail merging and so on"

Look out for the reviews in ST/Amiga Format and ST World, or send
S14.00 for further information.

The ST version is available NOW for all models at a price of £79.00.
The Amiga version will be released very soon. Watch this space.

Relating your order to your order

APR

Atari Ltd, Protext House, Watlington Road, Peterborough PE2 0BU.
24 hour credit card hotline, Access/Visa, 0733 200011.



BYTEWARE

(BYTERARE)
1 MARINE TERRACE, BUCKENLAND, TRING & NEAR ST1 1AT
TEL: 0948-414000

LARGE RANGE OF TITLES AVAILABLE NOW UP TO 40% OFF RRP
ORDERS DESPATCHED IN 24 HOURS
ADVANCE ORDER BY TWO OR FOUR MONTHS DELIVERY -
DISPATCHED ON DAY OF RELEASE
24 HOUR ANSWERING SERVICE

TITLE	ST	AMIGA	TITLE	ST	AMIGA
Support Data	10.00	10.00	Banker's Tale 1	---	---
Calendar of the Week	10.00	10.00	Banker's Tale 2	10.00	10.00
Calendar Master	10.00	10.00	Banker's Tale 3	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 4	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 5	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 6	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 7	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 8	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 9	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 10	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 11	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 12	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 13	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 14	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 15	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 16	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 17	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 18	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 19	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 20	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 21	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 22	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 23	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 24	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 25	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 26	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 27	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 28	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 29	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 30	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 31	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 32	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 33	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 34	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 35	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 36	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 37	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 38	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 39	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 40	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 41	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 42	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 43	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 44	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 45	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 46	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 47	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 48	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 49	10.00	10.00
Calendar	10.00	10.00	Banker's Tale 50	10.00	10.00

*Prices shown in detail

2 FREE DISCS WITH ORDERS OVER £20
5 FREE DISCS WITH ORDERS OVER £50

Prices include P&P in the UK
Overseas orders please add £2 per title for first two titles
and £1 per title thereafter

SOFTWARE ORDER FORM (BLOCK CAPITALS PLEASE)

TITLE	AMOUNT

SIGNATURE _____
NAME _____
ADDRESS _____

CHEQUE/POSTAL PAYABLE TO BYTERARE LTD



SIREN

SOFTWARE

SECOND DISC DRIVE

Add an extra drive for only £84.99

Our superb drive can really help you make the most of your ST allowing complex software to be run without disc swapping etc. The drive comes complete with all cables to connect it to any ATARI 1040 STF or 520 STE/M

- Ultra quiet
- Slim styling, colour matched to the ST
- Top quality Citizen/NEC drive mechanism
- 1 megabyte capacity (unformatted)
- Full one year parts and labour guarantee.

Available now only £84.99 inc. VAT & P&P

NEW

... AMIGA SOUNDBLASTER ...

NEW

Everyone knows that the Amiga has the best sound facilities available on any popular computer today. Unfortunately until now, unless you could connect your Amiga to your stereo system you could not appreciate the quality of the sound.

The AMIGA SOUNDBLASTER is a small stereo amplifier that comes complete with 2 high quality 20 WATT 3 way speakers. It is easily connected to your Amiga 500/1000 and adds a new dimension to all games.

- Comes complete with 2 high quality stereo speakers
- Twin volume/balance controls
- Headphone socket
- Very easy to connect
- Compatible with all software/hardware

♦♦ Free stereo headphones with all orders for a limited period ♦♦

Amiga Soundblaster is just **£39.99** including VAT and P&P

SIREN SOFTWARE TEL 061 228 1831

2-4 OXFORD ROAD, MANCHESTER M1 5QA



Computer Adventure World

WE STOCK AROUND 350 TITLES AT OUR RETAIL STORE AND SPECIALISE IN

ADVENTURES --- FANTASY --- WARGAMES --- STRATEGY

LATEST TITLES - MOST IMPORTED FROM THE USA - "EXPENSIVE BUT EXCELLENT" :

WARSHIP FROM 588	TACTICAL PACIFIC SURFACE NAVAL COMBAT WWII	ST ONLY	£38.00
EMPIRE	GRAND STRATEGIC GLOBAL CONFLICT MODELLED ON WWII	ST & AMIGA	£34.00
BREACH	COMMAND NAME & BUILD A SQUAD OF 25 SPACE MARINES	ST & AMIGA	£34.00
BREACH SCENARIO DISC	ADD A FURTHER 30 SCENARIOS TO ABOVE	ST & AMIGA	£18.00
STALINGRAD CAMPAIGN	LINE UP ON THE EASTERN FRONT	ST ONLY	£38.00
GREY SEAS GREY SIES	MODERN TACTICAL NAVAL COMBAT	ST ONLY	£38.00
SEVENTH FLEET	MODERN NAVAL CONFRONTATION IN THE PACIFIC	ST ONLY	£38.00
GREAT BATTLES	HEXES ON SCREEN 4 BATTLES W/ 600 SETTING	ST ONLY	£34.00
PLANES	YOU & 8 FANTASY CHARACTERS ON A QUEST TACTICAL COMBAT	AMIGA ONLY	£38.00
SETTLERS	JUST LIKE A BOARD WARGAME, ALL THROUGHS & GREAT	AMIGA ONLY	£38.00
BARON TALE I (BOTH) OR II (AMIGA)	CLASSIC FANTASY GRAPHIC ADVENTURES	£34.00	
STARFLEET	EXPANDED STAR TREK TYPE SCIFI PART ONE OF SIX	ST & AMIGA	£34.00
HOPKINS 8.3 IN 1 40 FOOTBALL	COMPLEX BUT THE BEST AVAILABLE	ST ONLY	£38.00
MICROLEAGUE BASEBALL	THE BEST GRAPHIC BUT NON ARCADE SIMULATION	ST ONLY	£38.00
MICRO 3 MANAGER/OWNERS DISC	ADD TO ABOVE BUY TRADE PLAYERS ETC	ST	£38.00
MICRO 3 180 TEAM 8 DISC	ALL THE ACTUAL PLAYERS READY FOR ABOVE	ST ONLY	£38.00

MANY MORE TITLES AVAILABLE - SEND FOR OUR FREE LIST - ENCLOSE LARGE SAE PLEASE

LATEST "OFFICIAL" HINT BOOKS & GUIDES - MAINLY FROM THE USA :

DUNGEONMASTER : L4 25, BARON TALE I OR II : £5.50, ULTIMA III OR IV : £7.50

"QUEST FOR CLUES" : 26 ADVENTURES MAPPED & SOLVED PROFESSIONALLY, FOR ONLY £19.75

PAYMENT : VISA - MASTERCARD - UK CHEQUE - GIRO-CHEQUE - POSTAL ORDER - EURO-CHEQUE
POSTAGE : UK FREE - PER GAME --- EUROPE £2 - ELSEWHERE £4 OR PER BOOK £2 - SENT BY AIR



Computer Adventure World

Bank Buildings, 1A Charing Cross, Birkenhead L41 6EJ
Telephone: 051-668 1132





DELUXE PHOTOLAB

When Electronic Arts released the phenomenally successful *Deluxe Paint II* art package they gave themselves a bit of a problem: how on earth do you follow that? The answer, it seems, is *Deluxe Photolab* - Ben Taylor picks his way through the pixels.

BRUSH OFF

Artists may be a bit too proud of the use of the word 'brush', as the simplest level a brush is much like its equivalent in an OS package like *Design II* - you can click on menu choices to change the drawing cursor to a circle, square, spray, or whatever. However, in the Amiga you can also make any area of the screen, no matter how large, and use that as a brush. This is how Amiga paint packages implement moving and copying bits of a picture - define it as a brush and then the whole area of its destination. Massive areas of colour can be moved around really fast by the Amiga's famous *delta* chip.

£99.95 ■ Amiga only, requires 380 Kbytes RAM ■ 11-49 Station Road, Langley, Slough, Berks SL3 8PH 0293 494421

What you get for your money with *Deluxe Photolab* is three separate programs, designed to complement one another. First and foremost is a paint package which can work in any Amiga graphics mode; second is an image processing utility program called *Colors* (English translation: *Colour*) to convert pictures from one screen mode to another among other things; and finally *Painters* prints out your pictures at a resolution of up to 100 feet square!

Photolab Paint

Photolab can work in any of the Amiga's screen modes. When you first run it you are presented with a menu screen offering any mode from low resolution (320 by 200) to high resolution (interlaced), and most importantly the 4096 colour HAM mode. You can also select how many 'bit planes' to use: 1 bit plane gives you



2 colours (black plus another), 2 planes 4 colours, 3 planes 8 and so on, subject to the limitations of the current mode.

Users of *Deluxe Paint* will immediately feel at home with *Deluxe Photolab*. It uses many of the Electronic Arts standard conventions

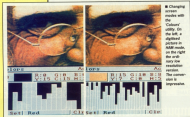
- define a brush with the right mouse key to move it, or the left mouse key to copy it, use the space bar to halt any operation, and so on. The colour palette is displayed on screen and also on a separate palette editing screen - you can specify a colour by eye, or by choosing Red/Green/Blue or Hue/Saturation/Brightness values. You can also specify start and end colours, and ask for a smooth sequence of shades to be created between them.

You can define brushes in the most Amiga way to enjoy most of the screen around, in HAM mode brushes redrawing is very slow, and you can't sweep a smooth line. This is because HAM brush work is done under software control, not by the *delta*. One excellent bonus is that you can turn-point brushes between different mode screens - define a brush in 4096 colour HAM interface mode, and you can go to a low resolution image and paste it in. The conversion is done for you.

A new feature in the *Deluxe* primary is 'brush wrapping'. Once you've defined a brush, you can draw any outline you like - a regular or freehand shape - and the brush is stretched to fit it. Squares a brush into a circle and you'll give the impression of things trapped in a bubble, for instance.

Another powerful feature is shade control. When drawing any shape to be filled, you can ask for the filling to be graduated. You can define a 'ramp', where the fill colour is solid, and it tapers away as you go radially outwards. You can adjust how fast it tapers off, and you can also 'tether' the shading so it either looks like contour lines (so different) or is a smooth mix (loads of others). There is, however, no support for ray tracing - in *Photolab* you can ask for a scene to be highlighted as though there was a light source at a given point.

All the regular paint features are also present, of course. Magnify





PATCHING THINGS UP

Many people know of MIDI as a musical interface standard for tying instruments, effects units and microcs together. It can also be used to transfer the actual sounds of the instruments, though, as Chris Jenkins explains.

Well, assume you realise that your ST or Amiga can become the centre of an electronic music system which would make musicians of us little as five years ago collapse with envy. With the help of MIDI, affordable computers like the ST and Amiga have found a place in every sort of music, studio from four-tracks in Finsbury to digital in Oxford.

But are you aware of all the possible musical applications for your computer?

MIDI music software for the ST and Amiga falls roughly into three categories. By far the most popular and immediate is MIDI sequencing, by which performances on MIDI synthesiser keyboards and other instruments can be recorded, edited and re-arranged. At the more exotic end of the spectrum are packages to automate the mixing process, print out music scores or create sounds by harmonic synthesis. In the middle, the application which attracts most attention after sequencing, is patch editing.

In the beginning....

The original synthesisers bristled with knobs and switches, one for each

sound parameter such as filter settings, envelopes, waveforms and modulation. This hardware was expensive and unreliable, and didn't allow sounds to be recreated after use, except by painstaking re-wiring of the settings. The logical step was to

store sounds in memory, and to store them in a digital format, especially with complex sounds which can have over 200 sound parameters.

Patch editing software restores the visual aspect of sound creation, allowing you to see the status of all the synthesis sound parameters on your

SOUND SAMPLE

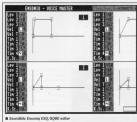
Digital synthesiser parameters accurately represent the form of acoustic sounds by 'sampling' them. This technique is also to making a digital 'recording' of the sound and storing it in memory or in disk.

THE ART OF NOISE

Like many musical software applications, patch editing has its own jargon, which can often be traced back to the earliest synthesisers.

When Bob Moog developed the voltage-controlled synthesizers, filters and envelope shapers which made practical synthesizers possible, electronic circuitry was bulky and limited. The first synthesiser 'modules', constructed from separate components, each linked together by 'patch cables'. Each different noise would require a different pattern of connections and potentiometer settings.

Later synthesiser modules instead of patch cables, and eventually the whole process became digital. With the introduction of the Sequential Prophet 5 and other polyphonic programmable synths, all the sound modules were hard-wired together, and the patch settings and sound parameters were stored in editable digital memories. Despite this, the phrase 'patch', meaning a particular group of sound settings, remains in use.



■ Soundblaster Executive EQ3.0/2.0 editor

put sound creation under digital control. Practically every modern synth since the Yamaha DX7 uses 'digital access' editing. This means that with the help of an LED or LCD display, and a slider or numeric pad, you select the number representing the sound parameter you wish to edit and enter a new value for it, which is stored in memory. A complete sound patch can then be assigned an internal memory position, recalled for use at any time, and in most cases re-edited in later requirements. Some synths store as many as 256 sounds on board, with more or relatively expensive cartridges or memory cards.

Digital access editing is cost-effective and reliable, but can be

display. Amplitude and filter envelopes can be represented as graphs to be manipulated on-screen, and imperishable functions such as formula FM algorithms make much more sense when shown in graphical form.

Patch editing software also makes valuable facilities like permutation patch creation, and in some cases the conversion of sounds from one synthesiser to another. Another advantage is the possibility of storing all your sounds on cheap floppy disks rather than expensive hardware cartridges. You can manage to cram almost 2000 DX7 sounds on one £1.50 blank disk; compare the expense of storing that amount of data on cartridges at around £70 for 256 patches! You can end up using a



good deal of money, despite the influx
and of partly selling packages at
\$20.00.

Because the CD's built-in MIDI facilities made it the obvious choice for most musicians, it's way above the fringe in the patch editing charts. Fortunately, several US companies are making amends, and we should see much more fringe-specific software soon.

Synthesis and monomers

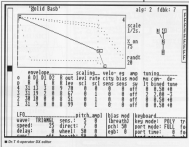
[illegible]

The popular target for editing packages is the Roland MT-32. The standard keyboard-based module is a multifunction unit, using the new and flexible Linear Arithmetic sound system. Roland says it has built-in PCM sampled drum sounds, and a digital music bank, but presently no preset patches if you want to edit its sounds; you can't though MT-32 sounds can be edited via MIDI. It has no front-panel control knobs or buttons.

One excellent option is Patchbox 32 from Tigris Design. It runs on the 285, was developed by the team behind the popular music software sequencer, and comes complete with a thorough manual and a book on programming the MIDI. Patchbox makes full use of RAM, and allows you to edit the MIDI's 128 preset sounds, edit note programming events, and PCM sampled drum sounds. Like many patch editing packages, Patchbox allows you to define new envelopes, shapes by picking up a "break" point and dragging it to a new position.

A popular alternative is the Tupper Artist **MTS** Library/Editor from Dr. T. The American package offers autopermutation of sounds, if you let the computer take over completely, the resulting sounds will probably be unusable, but by defining a "mask" setting you can leave some parameters unaltered and have more control over the result. There's also a feature to convert sounds from the more powerful G45 to the MTS-20, after the MTS instructions.

	Non-union	Union
Age		
<60	78	90
≥60	100	100
Gender		
Male	100	100
Female	100	100
Ethnicity		
Caucasian	100	100
African American	100	100
Hispanic	100	100
Other	100	100
Marital status		
Married	100	100
Single	100	100
Divorced	100	100
Widowed	100	100
Education		
<High school	100	100
High school	100	100
Some college	100	100
Bachelor's degree or higher	100	100
Occupation		
Professional	100	100
Semi-professional	100	100
Skilled	100	100
Unskilled	100	100
Retired	100	100
Health insurance		
Medicaid/Medicare	100	100
Private	100	100
No insurance	100	100
Smoking history		
Never	100	100
Former	100	100
Current	100	100
Alcohol consumption		
None	100	100
Light	100	100
Moderate	100	100
Heavy	100	100
Family size		
≤2	100	100
3–4	100	100
≥5	100	100
Household income		
<\$10,000	100	100
\$10,000–\$19,999	100	100
\$20,000–\$29,999	100	100
\$30,000–\$39,999	100	100
\$40,000–\$49,999	100	100
\$50,000–\$59,999	100	100
\$60,000–\$69,999	100	100
\$70,000–\$79,999	100	100
\$80,000–\$89,999	100	100
\$90,000–\$99,999	100	100
≥\$100,000	100	100



1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Soundways® Thinking, there's a 12,000-note sequencer along with the M1-52 editor. It features an advanced filing system by which you can search for sounds using keywords, rather than having to load, transfer and test a whole diskful to find the ones you want. There's also a Synthesizer D-50/550 for Roland's flagship synthesizer. This lets you work on four sounds simultaneously, copying parameters from one to another or merging them to form one complex voice.

Again, Dicks/Wid and ST centers are spared the offense; there's also Dr. T's D.I.-50, which shows two families of sounds in memory at the same time. You can still patchy randomly or semi-randomly, and swap sounds from one bank to the other, building up your own performance sets for the live or studio work.

Other

One of the most active companies in the field is SoundFile. There are approximately 37 editions for the Roland

[illegible]

Another range of ST editors comes from Hybrid Arts. The Android series, including CFAAndroid and GU-Android, offer both numeric and graphic editing, randomisation and storage of over 1,000 patches per disc.

(Chapman's Mom all stars) We got a lot
of... from you. Please please there is

WOW!
WIN!

A polyphasic system is one in which the product shows two or more of these, allowing you to give clients the advice that's best for them. Most financial institutions can create different models tailored to individual needs.

PATCH EDITING AND MIDI

MSDN was originally designed purely to exchange digital music information, such as pitch, note lengths and performance parameters including vibrato and pitch bend, but, because the MIDI format is digital and open-ended, new capabilities can be incorporated into it at all times. One of the first new patch exchangers: the patch data is stored in "patches", or single patches, or in entire banks of say 64 patches, can be transmitted by MIDI to a compatible synth, or to a computer for editing.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

include standards for the transfer of sound samples. Obviously, as sampling resolution becomes higher, the amount of data in each sample becomes greater - the greater the amount involved in transferring a digital patch, in this case the space limitations of MIDI begin to show themselves, and for this reason many professional sampling devices now incorporate PCM (pulsed-code modulation) "wave" or "Sound Computer" (Stratton) interfaces, which allow sample data to be transferred at more realistic rates.

RANDOM PATCHES

With the hundreds of parameters needed to fully program the sound of a modern synthesiser, the random or semi-random patching is a useful device for creating original sounds. It would take you hours to set parameters manually through the controls of different settings, and to have the same set of parameters for you is a good way of saving your time.

couple of synth? Of course it does, since the patch editing package deals with a selection of completely different synths. There's a partial solution in the form of 'generic patch libraries'. These packages don't allow you to edit sounds, but will store them and allow you to create your own performance banks. There are two good examples. Hybrid Arts' *Genpatch* for the ST copies with a substantial range of synths, including the Roland 590/590, MT32, 30-00, MKS-60, 30P, Alpha Jam 1 and 2, Jam 300, and patterns from TR-707, 727 and 909 drum machines, all the Yamaha DX/TX/S synths, the MS11 drum machine, Korg DRUMCORE, Poly 800/2, and D50-1 drum machine, Caste CE synths, Sequential Prophet 5, V5 and drum machine patterns, Ensoniq Mirage sampler and ESQ-1 synth, and even oddities such as the Lexicon PCM70 MIDI-controlled effects, and



SoundMaster Plus sample editor

advantage that it can be used as a desk accessory, hidden behind, say, a sequencer program, and pulled out each time you need to load new banks of sounds into your synths.

Free samples

Of course, it's also possible to use software packages to edit sound sample data. One of the most advanced such packages is DigitDesign Software for the ST.

Software creates sound waveforms using a principle called 'harmonic synthesis'. You define the wave shape, envelope and frequency for 32 software 'oscillators', then transfer the result by MIDI into a sample bank as the Akai S900. Although it's difficult to make your sounds come out the way you intend, you can create some weird and wonderful effects by mistake. A bonus is that DigitDesign can also emulate an FM Frequency Modulation synth, using one oscillator to modulate another in the same way the Yamaha DX synths do. A similar package from DigitDesign, GenWave, will transfer files from one S900 sampler to another.

Less generic sample editing packages include Oasis from Hybrid Arts. This allows you to display waveforms from the Ensoniq Mirage sampler, loop them automatically or manually, add, copy and insert samples, add fades, and create up to 64 keyboard split points each with independent velocity and looping parameters. There's also the ST-based Editor from Sonic (which does just about the same things) and has a built-in wave sequencer, the SoundFile ST from Dureware for the Akai S812 and S800, and Dureware's Soundware for the Akai S900 and other samplers.

Amiga advancing

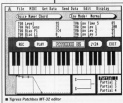
So what's the situation for the upstart registered Amiga? Many of the packages we've mentioned for the ST are slowly making their way to the Amiga, but getting hold of them is another matter; there are as yet few UK importers of Amiga music software.

Fortunately, things are looking up with the establishment of an international branch of the American software group MusicSoft. Apart from handling the existing SoundLibs products, MusicSoft also has a range of Amiga products planned. The first will be an MS-12 database library.

With any luck we'll also have a chance to see some of the latest Amiga products from the US before Christmas. SoundQuest have Windows editors for the Roland D50, MT-32, Yamaha DXR1, DX7, and T8012-DX100/21-07, Ensoniq ESQ-1 and ESQ-80, and Caste CE synths. There's also an Amiga generic library. Costs are around \$150 per package, which might mean around £150 by the time someone's gone to the trouble of importing them. Another disadvantage is that you need an Amiga with 1 meg of memory to use all the facilities of the SoundQuest packages.

The MusicSoft package from MicroVision promises much more than patch editing: it's a combined sequencer, keyboard controller, SMPTE/MIDI synchroniser, patch library, and sound editor. With a bit of technical knowledge MusicSoft also lets you write patch editors for any synth. It believes it when it says it.

As MIDI specialists become more and more powerful, and more and more controls are cut off to meet demands for lower costs, the ST and Amiga are becoming more necessary than lasers in the music studio.



Hybrid Arts Genpatch ST-32 editor

A cheaper though less flexible alternative is GenBanker from Paradigm. This handles only the Ensoniq ESQs, Yamaha FM synths and RX drum machines, and Caste CE synths, but it is half the price of the Hybrid Arts package. It also has the

CONTACTS

- C-LAB**, c/o Sound Technology, 81 Lechlade Road, Business Centre, Junction One, Lechlade, Stroud, G50 2BN, 0452 418000
DAVIDSON, c/o Apple's Keyboard, 26 Denmark St, London WC2, 01 254 6666
dbf, c/o dbf/MSD, 6 Hunter Street, London W6B, 01 298 2444
HYBRID ARTS, 100-10000 c/o Soundware, 26-28 Avenue Marie, Marseilles 8th, (London 0181 400 01-444 5100)
SONIC, 70-72 St, Warrington, Cheshire, W61 4BP, 0524 757000
SEQUENCERS, 40-42a Tower, Ohio Close, Birmingham, B1 2PP, 021 233 3440
SOUNDARTS, The Bakery, Ryeer Street, Derby, DE1 2PS, 0432 486601
SOUNDWARE, c/o Ensoniq Soundware, The Studio, Church St, Warrington, Cheshire, W61 4BP, 0524 757000
TRACOM, 27-28 Market Road, London SW1P 3AT, 01-444 2379
TRACOM, 17-18 Market Road, Southfields, London SW19 3SD, 01-474 2418



HOME ACCOUNTS

Keeping track of your money can be a complex business these days what with HP, credit cards, cash cards and so on, not to mention standing orders of varying frequencies and amounts. Pat Winstanley tots the points up for Digita's home accounts package.

RECONCILIATION

Reaching a bank statement can be a tedious experience until you learn that recent cheques and deposits may not yet have made it through the clearing system. To find your real position simply tick each debit on the statement against your cheque stubs and standing order list, and credits against wage (cheques etc.) then knock any unbalanced cheques off the balance and add on outstanding deposits to find your true position.

ST version reviewed, Amiga version due in August

£29.95 ■ Digita International, Kelsey House, Bains Road, Buntingford, Devon EX3 9LU (0395 45095)

Home Accounts aims to provide you with a simple method of keeping track of your monthly budget. It's intended for home use, and as such performs simplicity to full business accounting functions. The disk and glossy 40 page manual cover the program itself and a very short introduction file with just a couple of entries to show the format and commands used.

The system can handle up to 12 monthly data sets for up to 12 different accounts and up to 60 expenditure items. Up to 100 different standing orders may be entered and 360 transactions for each account which should be enough for even the most compulsive spender.

Having backed up the disk, load the program and set the date, your first task is to feed in details of

the various accounts you will be working with eg. current, deposit, credit card etc. Up to 12 accounts may be defined each having space for account number, name and type and a two letter code by which the program will recognise it.

Setting the scene

Other account details include the optional setting of minimum and maximum balances for the account which could be useful for monitoring interest received from savings accounts and incoming going concerns. The first option allows you to set an opening balance for the account. Additionally you may call up a menu card where extra details can be recorded as notes. These are ignored by the system but can be very handy.

Next you need to define the vari-

ous types of transaction, giving each an abbreviated code for the system to recognise. This will be used later if you want to take advantage of the optional budget facilities. Each type of expenditure is given a unique three letter code such as MORT for mortgage, ELEC for electricity etc.

Having defined all your accounts and typed the next step is to set up transactions for each. These are divided into regular and manual entries and each is treated differently by the system. Regular transactions are those entries which are known in advance (such as payment date and amount). Thus standing orders for mortgage, gas etc. will go here. You may also treat a regular transfer of funds from one account to another, say for savings, salary or housekeeping. There is also space to make comments which will be shown on later reports.

Manual transactions are used for cheques, variable salary, cash gifts (Christmas etc.). Since these are not known in advance they must be entered for 'posted', ie. accountants' posted posted as and when they occur. They are set up in much the same way as regular transactions but are posted to the accounts to which they apply rather than details for all accounts being mixed together. An additional facility is available whereby transactions may be marked so that they do not appear in the final report until they have also appeared on the bank statement. This allows unposted or uncashed cheques to be seen at a glance.

The posting of transactions to the various accounts is performed automatically by the system. It works on the basis of the difference between the date that the file was last saved and the date you feed in as current. Any transactions in the file, which are dated in between will be

Bank File System Account <u>EDIT</u> Report											
Regular Transactions											
Start	Rate	Exp Date	Type	F	From	To	Details	Debit	Credit		
11	Dec	07	23	Jan	00	0000	M	00	gas rates	47.00	
11	Dec	07	23	Jan	00	0000	M	00	water rates	25.00	
1	Jan	00	1	Jan	00	1000	M	00	transfer	200.00	
1	Jan	00	1	Jan	00	1000	M	00	savings	25.00	
1	Jan	00	1	Jan	00	0000	M	00	salary		750.00
4	Jan	00	4	Jan	00	0000	M	00	phone	20.00	
12	Jan	00	12	Jan	00	0000	M	00	insurance	25.00	
12	Jan	00	12	Jan	00	0000	M	00	electric	25.00	
11	Jan	00	11	Jan	00	0000	M	00	gas	47.00	
11	Jan	00	11	Jan	00	0000	M	00	mortgage	250.00	
1	Mar	00	1	Mar	00	0000	M	00	water rates	25.00	
12	Apr	00	12	Apr	00	0000	M	00	gas rates	47.00	
00			0	EDIT		Update	Enter	0	00		
CURRENT REPORT											
REPORT PERIOD											

■ Setting out your regular payments - standing orders - in Home accounts

SEEING DOUBLE

Home Accounts uses "double entry bookkeeping," which for the uninitiated is simply a matter of balancing a credit in one account with a debit in another. Thus a cash post withdrawal debits your bank account and credits the cash account in your pocket, while entry paid into your bank credits that account and debits your employer's bank. It may seem like double the bookkeeping and credits the bank twice stock account.



■ Two ways of seeing how badly overran you are. Bar Graphs and Pie Charts are just two of the ways of presenting data in reports.

applied to the accounts to which they refer to produce an up-to-date balance.

Now the news

If correct, all this work would be for nothing unless the results of all the transactions could be shown, and Home Accounts has a comprehensive reports menu.

Any account can be presented in the form of a bank statement either to the screen or printer. You can choose whether or not to include unrecorded transactions such as unpresented cheques, which months to display, and even which types of transaction should be included.

Another option is the facility to search for and display any transactions whose details you define according to the comments you've entered in the files. Thus you could list all the cheques you have made out to a computer shop by making sure that the details of each such transaction contained the name of the shop; then asking the program to search for that name. Wildcards are also available to match any characters.

It's easy to forget the exact notes used to refer to different types of expenditure so these can also be listed either to the screen or printer, as can a list of all regular transactions for the month.

The manual is divided into three sections, first a general look at the capabilities and limits of the system with notes on computer terminology, looking up data and getting started followed by a step-by-step section on how each feature is used. The third section goes into more general detail of the different features. Although all necessary information is included, being aimed at the home user a little more theory on bank reconciliations and double entry would have been

adequate.

Operating the system is fairly straightforward. The mouse is used to select options from pull-down menus while (Tab) or the mouse pointer are used to place the cursor where required. Some of the editing screens allow text scrolling by means of video player style controls. On the whole I

to see some form of simple spread sheet facilities rather than a static budget account, and such an addition would round the package out. For me it stops just short of being a really Useful Engine but good value if you're more interested in keeping records than juggling finances.

WHERE'S ALL THE MONEY GONE?

Are you one of those people who can budget their income and expenses to the last penny, never checking from the end of the year, you aren't going to be reading Home Accounts anyway. But if you're one of the vast majority whose actual earnings never quite seem to match your budget, then there's a useful facility for you.

Using the codes which were set up earlier you can set up a budget for each type of expected expenditure for the whole of the accounting period. These values all actual transactions have been posted to the relevant accounts you can use the program to tell you just where and by how much your spending has varied from the budget. The reports can be shown as a list of absolute figures, a bar graph or a pie chart, the pie chart is useful for showing what

proportion of the total expenditure is taken up by different categories, although viewing computer expenditures as housekeeping probably won't test your patience for long.

Each month of the accounting period is shown separately so it's easy to see where things have gone wrong. Strangely, while the representation of amounts is in different coloured patterns on the charts, the key to types is shown in black and white patterns which are indistinguishable from each other. While different types can be worked out by counting along the key on the bar graph, this just isn't possible with the pie chart.

The graphics cannot be sent to the printer directly, but may be dumped using the (Alt) and (Print) keys.

found the controls easy to learn and very positive, except for rather sluggish mouse button response at times.

At the end of all this, it's even possible to load just part of a file as a template, say at the year end when all you really want are the regular transaction details together with opening balances.

The bottom line

Although intended for the home user, the program is equally suitable for small businesses, clubs, charities and education. You will find it to be quicker to use paper and pencil for general bank reconciliations etc., but the budget progress reports are definitely useful to see where the spending goes, and much faster than manual methods. It would have been nice

for

- Very quick after initial data entry
- We find it to confuse the home user
- Simple controls

against

- Concepts poorly explained for the uninitiated
- Graphics difficult to print/distinguish
- Budget shows what you shouldn't have spent!

features

1 2 3 4 5

performance

1 2 3 4 5

ease of use

1 2 3 4 5

manuals

1 2 3 4 5

format value

1 2 3 4 5



HOW TAKEN



Castle Computers

© 2006 The Authors
Journal compilation © 2006 Blackwell Publishing Ltd

Fine and Fugate	18.00
Good Movie	10.00
Corruption	18.00
Video Action	10.00
Current News from Belgium	10.00

Legend of the Secret	\$1.00
Legend 1	\$1.00
Legend 2	\$1.00
Legend 3	\$1.00
Legend 4	\$1.00
Legend 5	\$1.00
Legend 6	\$1.00
Legend 7	\$1.00
Legend 8	\$1.00
Legend 9	\$1.00
Legend 10	\$1.00
Legend 11	\$1.00
Legend 12	\$1.00
Legend 13	\$1.00
Legend 14	\$1.00
Legend 15	\$1.00
Legend 16	\$1.00
Legend 17	\$1.00
Legend 18	\$1.00
Legend 19	\$1.00
Legend 20	\$1.00
Legend 21	\$1.00
Legend 22	\$1.00
Legend 23	\$1.00
Legend 24	\$1.00
Legend 25	\$1.00
Legend 26	\$1.00
Legend 27	\$1.00
Legend 28	\$1.00
Legend 29	\$1.00
Legend 30	\$1.00
Legend 31	\$1.00
Legend 32	\$1.00
Legend 33	\$1.00
Legend 34	\$1.00
Legend 35	\$1.00
Legend 36	\$1.00
Legend 37	\$1.00
Legend 38	\$1.00
Legend 39	\$1.00
Legend 40	\$1.00
Legend 41	\$1.00
Legend 42	\$1.00
Legend 43	\$1.00
Legend 44	\$1.00
Legend 45	\$1.00
Legend 46	\$1.00
Legend 47	\$1.00
Legend 48	\$1.00
Legend 49	\$1.00
Legend 50	\$1.00
Legend 51	\$1.00
Legend 52	\$1.00
Legend 53	\$1.00
Legend 54	\$1.00
Legend 55	\$1.00
Legend 56	\$1.00
Legend 57	\$1.00
Legend 58	\$1.00
Legend 59	\$1.00
Legend 60	\$1.00
Legend 61	\$1.00
Legend 62	\$1.00
Legend 63	\$1.00
Legend 64	\$1.00
Legend 65	\$1.00
Legend 66	\$1.00
Legend 67	\$1.00
Legend 68	\$1.00
Legend 69	\$1.00
Legend 70	\$1.00
Legend 71	\$1.00
Legend 72	\$1.00
Legend 73	\$1.00
Legend 74	\$1.00
Legend 75	\$1.00
Legend 76	\$1.00
Legend 77	\$1.00
Legend 78	\$1.00
Legend 79	\$1.00
Legend 80	\$1.00
Legend 81	\$1.00
Legend 82	\$1.00
Legend 83	\$1.00
Legend 84	\$1.00
Legend 85	\$1.00
Legend 86	\$1.00
Legend 87	\$1.00
Legend 88	\$1.00
Legend 89	\$1.00
Legend 90	\$1.00
Legend 91	\$1.00
Legend 92	\$1.00
Legend 93	\$1.00
Legend 94	\$1.00
Legend 95	\$1.00
Legend 96	\$1.00
Legend 97	\$1.00
Legend 98	\$1.00
Legend 99	\$1.00
Legend 100	\$1.00
Legend 101	\$1.00
Legend 102	\$1.00
Legend 103	\$1.00
Legend 104	\$1.00
Legend 105	\$1.00
Legend 106	\$1.00
Legend 107	\$1.00
Legend 108	\$1.00
Legend 109	\$1.00
Legend 110	\$1.00
Legend 111	\$1.00
Legend 112	\$1.00
Legend 113	\$1.00
Legend 114	\$1.00
Legend 115	\$1.00
Legend 116	\$1.00
Legend 117	\$1.00
Legend 118	\$1.00
Legend 119	\$1.00
Legend 120	\$1.00
Legend 121	\$1.00
Legend 122	\$1.00
Legend 123	\$1.00
Legend 124	\$1.00
Legend 125	\$1.00
Legend 126	\$1.00
Legend 127	\$1.00
Legend 128	\$1.00
Legend 129	\$1.00
Legend 130	\$1.00
Legend 131	\$1.00
Legend 132	\$1.00
Legend 133	\$1.00
Legend 134	\$1.00
Legend 135	\$1.00
Legend 136	\$1.00
Legend 137	\$1.00
Legend 138	\$1.00
Legend 139	\$1.00
Legend 140	\$1.00
Legend 141	\$1.00
Legend 142	\$1.00
Legend 143	\$1.00
Legend 144	\$1.00
Legend 145	\$1.00
Legend 146	\$1.00
Legend 147	\$1.00
Legend 148	\$1.00
Legend 149	\$1.00

[illegible]

RESEARCH DESIGN

[illegible]

1. **Author:** [Name]
 2. **Title:** [Title]
 3. **Journal:** [Journal]
 4. **Volume:** [Volume]
 5. **Issue:** [Issue]
 6. **Page:** [Page]

Living Stones	10.00
Parson	10.00
Photography	27.00
Real World	10.00
Radio Radio	25.00
Reclaim	10.00
Requiem	10.00
Shadows	10.00
Stomach	10.00
Street	10.00
The Language People	10.00
Time and Space	10.00
Unspoken	10.00
Vanessa	10.00

Journal of Management Inquiry 22(1)

Genre	Adapted from	Release date
Horror	Stephen King	1990
Thriller	Michael Crichton	1991
Science Fiction	Philip K. Dick	1992
Fantasy	J.R.R. Tolkien	1993
Adventure	Robert Bly	1994
Comedy	Neil LaBute	1995
Drama	William Shakespeare	1996
Documentary	Ken Burns	1997
Biography	Tom Hanks	1998
History	David Byrne	1999
Music	Bob Dylan	2000
War	Michael Ondaatje	2001
Crime	Michael Chabon	2002
Science Fiction	Michael Crichton	2003
Horror	Stephen King	2004
Thriller	Michael Crichton	2005
Science Fiction	Philip K. Dick	2006
Fantasy	J.R.R. Tolkien	2007
Adventure	Robert Bly	2008
Comedy	Neil LaBute	2009
Drama	William Shakespeare	2010
Documentary	Ken Burns	2011
Biography	Tom Hanks	2012
History	David Byrne	2013
Music	Bob Dylan	2014
War	Michael Ondaatje	2015
Crime	Michael Chabon	2016
Science Fiction	Michael Crichton	2017
Horror	Stephen King	2018
Thriller	Michael Crichton	2019
Science Fiction	Philip K. Dick	2020
Fantasy	J.R.R. Tolkien	2021
Adventure	Robert Bly	2022
Comedy	Neil LaBute	2023
Drama	William Shakespeare	2024
Documentary	Ken Burns	2025
Biography	Tom Hanks	2026
History	David Byrne	2027
Music	Bob Dylan	2028
War	Michael Ondaatje	2029
Crime	Michael Chabon	2030
Science Fiction	Michael Crichton	2031
Horror	Stephen King	2032
Thriller	Michael Crichton	2033
Science Fiction	Philip K. Dick	2034
Fantasy	J.R.R. Tolkien	2035
Adventure	Robert Bly	2036
Comedy	Neil LaBute	2037
Drama	William Shakespeare	2038
Documentary	Ken Burns	2039
Biography	Tom Hanks	2040
History	David Byrne	2041
Music	Bob Dylan	2042
War	Michael Ondaatje	2043
Crime	Michael Chabon	2044
Science Fiction	Michael Crichton	2045
Horror	Stephen King	2046
Thriller	Michael Crichton	2047
Science Fiction	Philip K. Dick	2048
Fantasy	J.R.R. Tolkien	2049
Adventure	Robert Bly	2050
Comedy	Neil LaBute	2051
Drama	William Shakespeare	2052
Documentary	Ken Burns	2053
Biography	Tom Hanks	2054
History	David Byrne	2055
Music	Bob Dylan	2056
War	Michael Ondaatje	2057
Crime	Michael Chabon	2058
Science Fiction	Michael Crichton	2059
Horror	Stephen King	2060
Thriller	Michael Crichton	2061
Science Fiction	Philip K. Dick	2062
Fantasy	J.R.R. Tolkien	2063
Adventure	Robert Bly	2064
Comedy	Neil LaBute	2065
Drama	William Shakespeare	2066
Documentary	Ken Burns	2067
Biography	Tom Hanks	2068
History	David Byrne	2069
Music	Bob Dylan	2070
War	Michael Ondaatje	2071
Crime	Michael Chabon	2072
Science Fiction	Michael Crichton	2073
Horror	Stephen King	2074
Thriller	Michael Crichton	2075
Science Fiction	Philip K. Dick	2076
Fantasy	J.R.R. Tolkien	2077
Adventure	Robert Bly	2078
Comedy	Neil LaBute	2079
Drama	William Shakespeare	2080
Documentary	Ken Burns	2081
Biography	Tom Hanks	2082
History	David Byrne	2083
Music	Bob Dylan	2084
War	Michael Ondaatje	2085
Crime	Michael Chabon	2086
Science Fiction	Michael Crichton	2087
Horror	Stephen King	2088
Thriller	Michael Crichton	2089
Science Fiction	Philip K. Dick	2090
Fantasy	J.R.R. Tolkien	2091
Adventure	Robert Bly	2092
Comedy	Neil LaBute	2093
Drama	William Shakespeare	2094
Documentary	Ken Burns	2095
Biography	Tom Hanks	2096
History	David Byrne	2097
Music	Bob Dylan	2098
War	Michael Ondaatje	2099
Crime	Michael Chabon	2100

Abstract

Q Ball	6.99
Fixed Runner	6.99
Raw Cell	3.99
War Zone	4.99
Knallkniggy	7.99
Super Hatty	8.99
Molins Cross	6.99

Season in Chains	19.95
Scars: Two	19.95
17 Minutes Greater	29.95
Songbook	19.95
Songbook-Gun Set	19.95
Starbucks Book	19.95
Capitol Book	19.95
Capitol Bookband	19.95
Traveller	19.95
Spice Wars	19.95
Time and Space	19.95
Annals of Media	19.95
Gun: Military Use	19.95
Gun: Gun	19.95
Gun: Gun	19.95
Gun: Gun	19.95
Gun: Gun	19.95

Journal of Management Inquiry

Product	Price
Basic System	\$1,000
Advanced System	\$1,500
Enterprise System	\$2,000
Cloud System	\$1,200
Mobile System	\$1,100
Hybrid System	\$1,300
Custom System	\$1,400
Subscription System	\$1,600
On-Premise System	\$1,700
Managed System	\$1,800

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Bureaucracy	12.00
Leather Goddess	12.00
Lurking Horror	12.00
Templewood	15.00
Wood and Bone	12.00

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

[illegible][illegible][illegible]

Foundations: Study	15.00
Design Time	15.00
Analysis: Material	15.00
Investigation: Material 2	15.00
Total: 60.00	

[illegible]

Post	100
Post/Topic	100

RESEARCHER: JAMES M. HANCOCK

12.75

Adjusted R-squared	0.63
Adjusted R-squared	0.63
Age in Years	-1.36
Alcohol	0.00
College	0.00
Urban Areas	0.00
Fluoride	-1.36
First Female Surge	0.00
Estimate	-1.36

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398</
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	--------

STOP PRESS ON THE SET
 (A ONLY, JET FROM SHELBOURNE)
 PPP IN IN OUR PRICE (A 66)
 88. 00 0000

Living Systems	100%
General Science Practice	100%

© 2006 The Authors
Journal compilation © 2006 Blackwell Publishing Ltd

[illegible]

Received 12 May 2006; accepted 12 May 2006

TABLE OF FACULTY SOFTWARE

To extend the excellent service we already offer our customers we will now check every piece of software before we send it out!

As this service will take time and money, we have been forced to increase our prices slightly. Please remember we will use first class post.

CASH & CREDIT

The company that sends you the equipment

Any game not released will be sent on the day of release.
These are mail order prices only.

CASTLE COMPUTERS THE COMPETENT MAIL ORDER COMPANY



A MIDSUMMER SPRITE'S DREAM

If you're a graphic artist, how do you go about designing the characters and backgrounds for a game? And what features do you need in your art package to do it? Nigel Brownjohn, designer of the soon-to-be-released ST *Verminator* from Rainbird, explains a little of the production process behind a major game's graphics.

Providing 16-bit software is a very mixed business. The sense of achievement when a product is released is undeniably euphoric; however, the confident artist at the production team concerned can expect staggered returns and a degree of disbelief that the product was ever finally finished.

This is not usually the case with 32-bit games, but the call for depth, color, texture and originality of 16-bit software can lead to endless months of worry and backbreaking work in all departments. For a reviewer to sit at a desk and write an article that criticizes a piece of games software is, for enough, and I'm afraid many games deserve such reviews, but to

blindly damn the production team into the bargain without bothering to ask them why they think their product is a little weak in certain areas seems unfair. When a game falls short of the mark it is not necessarily due to a company trying to rip the public off, as some articles would have you think.

Problem page

To produce a piece of games software in theory is relatively simple; in practice this is definitely not the case. When designing a game it is best to take into account that any small thing that can go wrong will go wrong. Money problems, ill health, unfore-

seen difficulties and an army of other gnomes, all tend to appear as you go as a project gets under way. If the production team doesn't care about the game they're creating, then many of these problems don't occur and the production time is relatively short and uneventful. Producing bad games is easy!

The best 16-bit games appear to be those which have had a year or two's work put into them. I think this is evident in games such as *Life in Dungeons & Magic*. The progression of games software onto the more powerful machines with their increased graphics potential has likewise increased the relevance of the graphic: artistic, cheesy graphics are no

Nigel Brownjohn is a freelance graphic artist. His early experiences included the graphics for *Knave*, *Jack's a Lady*, *Master's Mystery Box*, *Night* and



Ice Palace. His first ST project was *Masterpiece*, and a lot of his time went to the game into the forthcoming and highly original *Verminator* for the Amiga.



■ *Vermor*, one of Brownjohn's more creative designs



Two scenes from "Adventure," Atari's pioneering game from 1979. It's a wordy graphics adventure where you play a three-fingered creature named *Duke*. *Adventure* with a twist: to clear up the threat of *Duke's* a microscopically parallel dimension with more than a passing resemblance to the inside of a tree. Only this tree has stairs, ladders, tanks, a mafia and a hint of mutated *Duke*. The aim is to become rich and successful and there's a number of ways of going about this. You can kill pests at day - with your hammer, bricks, leaves and cluster bombs - to earn money the hard way, or you might try harvesting a magical tree taking in the many images in *Adventure*. Alternatively, you can arrange to mail the *Adventure* with both the land and the fluid and simply return to pay them - thereby saving yourself up in a letter of the *Adventure* *Adventure* for you can simply spend all your time in the *Adventure* and *Adventure* your way to the top. *Adventure* a lot like this, eh?



A LIFE IN THE DAY OF A GAME

The work involved for the graphic designer naturally varies depending on the nature of the game. If I've been commissioned to do a conversion of an 8-bit game, then I'm usually just taking the original graphics and re-rendering them in a higher quality, as I'm given very clear guidelines to aim at.

Sometimes I suggest a game to a particular software house, other times they approach me with an idea, and I work up a design for it, however that is, like a good few explanations, and that kind of thing, whereas *Adventure* are of course quite different. You've got to tailor your ideas in a style that you know will be acceptable to the publishers.

More recently, the team working in partnership with Chris Hensley, of *Paganware* fame, and together we've been doing the complete game design. This is much more challenging, and of course more interesting. We come up with the basic game between us, then I produce initial graphics and maps. Chris gets to work on programming it, and gradually we put down levels and finish and it all comes together. A game is never finished until the deadline gets you - with *Adventure*, for instance, the main characters and maps were finished long ago, but we're still adding things here and there. I'm always thinking of little touches to make games just that bit richer.

My work is all done on the Atari ST, since that seems to be the state the bulk of the games in the UK will head on, and on the one most software houses are interested in. Usually my ST games is converted for the Amiga within a month or two, but that doesn't really affect me. The graphics for designed stay the same, the backgrounds and everything are just ported over and Chris gets to work on the reprogramming.

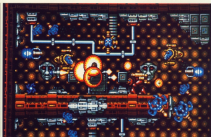
longer acceptable on such machines. Unfortunately the new possibilities in terms of game structure of such graphics are often not fully explored at present for economic reasons: most software houses are not interested in 3D games that cannot be converted to the smaller 8-bit machines where the bulk of the profits still lie.

Pick a package

It is within these restrictions that the graphic artist must operate, and so it is vital that images which are technically simple look as much striking as possible. In order to achieve this, graphic artists must have the most effective graphics software they can lay their hands on, as the standard of these packages not only dictates the speed of production but also the quality of the work. Having said this, it is equally important to use software you feel comfortable with. If you feel clumsy using a particular graphics package then the chances are your work will suffer in interest, falling short of its full potential, or it will take you

twice as long to produce it. Commercially speaking, this is very less.

The work I am involved with usually concerns animated graphics and the backgrounds they most often. Therefore I tend to an package that is geared to achieving these things. I use *Hampton's Advanced Art Studio* which although lacking some of the qualities of *Film Director* is more than adequate for my particular requirements. *Art Studio* has a detailed yet comprehensive layout, and presents a far less daunting prospect for the artist than many art packages that look far more geared for word processing than graphics! There is also a useful help mode that is constantly deployed, supplying vital information at a glance. When the user gets more familiar with the package this can be patched off so that it doesn't interfere with work at high speed. Another thing that makes *Art Studio* so comprehensive is its superb use of icons. These icons, unlike some I could mention, are well drawn and true to their functions.



■ A scene from Huxson's *Guardian*, another distinctly busy screen from Nigel's Roadshow.

As well as being very comprehensive, Art Studio is also extremely good for sprite construction. When sprite frames have been drawn so a grid they can be transferred instantly to the waiting files for instant animation – just define the first and last frames of the sequence, click on the animation icon and your sprites will leap around the screen before you in its full glory.

My personal requirements centre around animation, as that is what first attracted me to computer graphics. Ideally what I need is a totally transparent affordable package capable of manipulating any sized object through a full 360°. Also if it could work out all the inbetween frames of the animation, then it's given it the relevant key frames. I'd be a very happy man so this would save me hundreds of hours' work.

Real time animation is a beautiful thing, but people are sometimes unaware of the mindboggling task of co-ordinating all the hundreds of pixels that go into making up a piece of animation. The bigger the sprite, the more difficult this becomes as the various parts of the figure are not moved in a big chunk but dot by dot. There are various functions to assist the process such as 'copy', 'rotate' and 'flip', but they never do much to help on the whole.

Economy course

Creating backgrounds for games on the Art Studio is done using its media-rich 'map mode'. This can create vast maps comprising thousands of pre-drawn blocks and allows the graphics artist to develop his talents in this field to perfection. Building maps out

of 16 by 16 pixel blocks is made far more difficult by the constant need for economy in a program. An important part of the graphic artist's work is not only to produce excellent graphics but to do so using the minimum number of blocks, frames etc. When this is applied to map construction the graphic artist must make his 16 by 16 blocks as versatile as possible. A block designed to look like one object should, if possible, be used to look like several other objects on the map. This process is endless and can be mindboggling in its implications.

Art Studio allows me to draw and animate sprites of any reasonable size, it allows me to build huge game maps and animate them, as well as drawing screens etc. However, what I wouldn't give for a fusion of Art Studio and Film Director! Art Studio unfortunately only allows me to animate one sprite at a time which is crap when I'm designing and drawing sprite games with up to 20 sprites zooming around and interacting on screen simultaneously! I never get the full picture until a programmer has coded all my graphics into the game, and by then, due to looming deadlines and other various factors, it's too late to change anything. What I find myself looking for these days is not so much a graphics editor as a pseudo games editor!

When doing graphics for an Atari ST game the first thing I usually tackle is the main character, as this dictates a lot of the flavour of a game. For this reason it is well worth putting a lot of thought into, as there's nothing more depressing than seeing yet another spacewar or run-orthogonal spacerwar with a laser gun crawl into the screen

at the start of a game. First impressions really count.

Originality and attention to detail are the keys to producing high quality graphics. This applies to all aspects of the game and its graphics. The graphic artist, apart from working out how big the map should be or how many frames to use is total on the sprites, should also work out exactly what he or she wishes to achieve as far as the 'look' of the game goes. It's always well drawing lots of good looking sprites and maps, but if they don't all complement each other and look like part of the same thing, then the game's flavour will suffer drastically as a result. Permanence, for example, was designed to look pleasantly weird, very colourful and non-sensical while maintaining a strong identity. The main character is very amusing and totally original. Whether the end result of all this thought and care is successful is not up to me, the designer, to say, but personally I'm very happy with it and I know a lot of other people are too.

3-D sprites next?

With the increase of three dimensional graphics in games software, many people are saying that the day of the computer sprite is drawing to an end. I don't consider this to be true; better graphics software and bigger machines mean improved sprites with proper support for rotations, light sources, shading and perspective.

If three people could see the images in my head or even had a chance to glance through my personal graphics files, I know for a fact they would soon change their views.



■ *Storyboard* works on an ST, and otherwise Richard's *Advanced Art Studio* is his workstation. *Microcraft's Film Director* has a lot going for it too, and is sometimes a better bet.

SKYCHASE

the final test



... airborne combat for every simulation fan. Modeled after USAF training competitions, take your place from a dizzying array of the world's leading fighters in this thrilling one or two player simulation. With user-definable features, there is an endless series of possibilities to Sky Chase as you battle against your adversary. You can find out what might really happen when the speed of M19-31 Footound meets the agility of an F-16 Falcon - with you at the controls of either!

Features:

- 7 front-line jets to choose from
- Great sound effects
- User definable fuel, ammunition, G-Forces, playing area and more
- One or two player options
- 5 skill levels
- Sky Chase poster and T-Shirt offer





FUTURES

Portrayed as metal monsters carved in the image of man, the robot is nothing more than science fiction. Or is it?

■ **FACT:** robots have existed since the 1950's.

■ **FACT:** many have computational power greater than the human brain.

■ **FACT:** muscle is nothing compared to rippling metal.

■ **FACT:** industry uses robots for manufacture, packing and painting; any science fiction film worth its salt features robots, some real, most spoof.

■ **FACT:** personal robots introduced this decade are more numerous than versions of AmigaDOS and GEM combined.

■ **FACT:** but nobody has produced a robot which has the intelligence of the human mind or the agility of the human body.

So where are they and who's using them? Will Marvin, the Terminator or No 5 ever "come alive"? Richard Monteiro (R2M2 to his friends) investigates.

BY YOUR COMMAND



WELDING

Perhaps the most famous example of AI is Joseph Weizenbaum's *Eliza* program which provides basic intelligent conversation with a computer. Weizenbaum has a great sense of the subject (it seems like many people took *Eliza* seriously), the rationale being that AI's "very complete" might be put to use in helping of people in every critical period.

ROBOTS AND MEN

"Robot," being a combination for close future, was first coined in 1920 by Karel Capek in his play *Robota*. *Robota* was also sponsored from fiction — in this instance from Isaac Asimov's book *Robota* published in 1942. Although the concept of the artificial man-made man is Greek legend, it wasn't until 1941 that the first factory robot was created.

DAY OF THE ROBOT

Ever since Crichton's *Raid* Capek coined the word robot, the world has been treated to visions of fear-inducing machines carved in, and often carrying up, the image of man. It is this aspect of robotics, the idea that intelligent hunkers of metal and silicon will reflect the human race's worst rather than its virtues, that has been built on

by many science fiction authors. While it provides great entertainment, it is — for the moment — fiction.

Before the advent of home or personal machines, computers were large and very expensive. Typically, an early computer would fill a warehouse and keep tens of operators in work. This is also true of early robots: huge industrial beasts taking up vast floor space and costing millions. The beginning of the decade, however, saw an explosion in the personal robot market; today there are hundreds of toy robots, computer-controlled robot kits

and small-scale productive robots.

There is nothing mysterious about a robot; it has four main parts. Firstly, there is the outer structure and mechanical design. Secondly, there are motive power producers, which give the robot movement. These are called actuators. Thirdly, the robot must recognize its position and know what it's working on — for this it uses sensors. Finally, the robot's software must be controlled and coordinated — usually the role of the computer, although specialized circuitry is used in smaller robots.

ARTIFICIAL INTELLIGENCE

There are many robots that require sophisticated programs to allow them to learn from their experiences and make decisions based on those experiences. This type of pseudo-learning is known as Artificial Intelligence (AI). Together with Knowledge-Based Systems, AI programs are generally large databases containing known facts about a state or task or place, a set of rules for generating a required action when an event occurs and a strategy processor for changing and rules as experienced demands.

The application of AI may result in robots being able to design a product for a particular application and then manufacture the item without any human intervention. Renault already have a robot that can take a full-scale model of a vehicle out of polystyrene, then computer-based plans in a matter of hours.



TELECHIRS AND EXOSKELETONS



■ The most common use for telechirs is to handle dangerous materials. The operator sits in safety behind protective glass while the mechanical arms isolate the operator's every movement. Other forms of telechir magnify or reduce the operator's movements.



■ Many jobs in power plants, a high-tech environment used for testing and controlling heavy equipment, feature handling the pressure (James Adams).

Remote control devices have often been used to extend the reach, power and hardness of human limbs, but it wasn't until after the Second World War that this type of machinery advanced in range and bounds (see). As scientists were required to manipulate radioactive substances in the atomic energy program, robot technology had to advance to provide the means.

Telechirs, being Greek for "hands at a distance", are remote manipulators in constant use in nuclear plants, chemical factories, explosive plants and other sites where dangerous substances and devices have to be handled by humans from a distance.

Microscopic telechirs are used to extend rather than merely the movements of a human hand; concepts operating on the brain or knee, scientists dissecting microscopic samples and technicians feeling microscopic devices all use them to reduce control scale movements to precise fractions of an inch. Other remote devices do the opposite by magnifying movement and amplifying the operator's force. Many cars, for instance, have servo-assisted brakes in which the force of the human foot is amplified by hydraulic or pneumatic power.

THE THREE DAY WEEK

After the Second World War, when companies were looking at ways of improving the efficiency of mass production (more merchandise, less rejects) — that sort of thing, Ford in the USA showed the world the way by having the first factory robot installed. Today there are around 30,000 industrial robots in Japan, 10,000 in the USA and 2,000 in Britain. There appears to be no lack of demand for the industrial robot — they do the difficult, monotonous, dirty, dangerous jobs that we humans love to avoid.

So what effect will robots have on society? Already industrial robots are used for coal mining, servicing nuclear power stations, cleaning sewers and packing food. The pack is already being left in manufacturing plants which allow for greater output, and higher quality can only be achieved by automation. More and more redundancies with increasing staff working fewer hours. The more agile and intelligent robots become, the less there will be for us to do.

But on a brighter side, robots might eventually write magazines (Globe would say they already do — LA), do the shopping for us, cook our food, drive buses, provide our television and film entertainment, take over from surgeons. One school of thought suggests that, in the long term, this will indeed be the case. So, no more work for Jack; he certainly won't be dull.

No matter how important robots are to the World's industrial fabric, it

is wrong to view them purely in terms of economics and productivity — for instance, their use in homes as a source of both entertainment and education is rapidly catching on.

What part will robots play in the future? The idea of a world dominated by mechanical men existed long before robots were ever invented and, in fact, such a scenario is no closer than it was 80 years ago. Attempting to predict the development of robotic technology is still the province of the SF writer.

However, if the robot is to become more useful, it must become more mobile — which means getting rid of wheel and track arrangements and replacing them with legs! (not two, but three or four for stability). The robot will need to become lighter, plusher and carbon fibre must

be used in place of traditional steel structures. Similarly their method of sensing will have to become far more accurate. All this will give them greater freedom and flexibility. Then, and only then, will we see the emergence of the true thinking, moving machine.

■ Flexible Manufacturing Systems (FMS) are starting to replace the thunderous dedicated automation systems. FMS robots load and unload components from machine tools like the latter programmed, often, and run then by preprogrammed to produce new products.



THEORY

Perhaps it's time to reflect on Isaac Asimov's Three Laws of Robotics which lay down the rules for robots to be subjected to as a future, robot-oriented, world.

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey the orders given it by human beings, except where such orders would conflict with the First Law.
3. A robot must protect its own existence, as long as such protection does not conflict with the first or Second Law.

REALITY

The futuristic, imaginary Robot (Globe With Logical Entry Response) is one of the delightful scenarios employed by the army. The Logical Entry Response in this case is top 800 machine guns. It is designed to control operations and personnel forces. But what if it were a pursuing armoured fist, that's not news for the armists. However, the army are planning to incorporate robot weapons, and not war substitution.



AMIGAS IN INDUSTRY

(Globe) in France is the virtual location of AMIGAS interfaces, specialists in man/computer/machine interaction. After giving up his job as director of a daily in 1983, Richard de Blais set up AMIGAS. The more people he has paid off as the company is involved in producing software and interfaces for controlling dairy-product packing robots: another project, Home Computer Systems, is now complete (details elsewhere in these pages).

Deblais located in Châteaufort, Sauter and Thierbary are already using the system which consists of large packing machinery (handling over 250,000) interfaces between computer and machinery, several robotised Amigas (general) to 4,000s with in-built hard drives) and Telexplus software. The total cost is still under £200,000 which, says de Blais, is very reasonable.

The interfaces and software are all de Blais's work, the network, Telexplus, is from Postelnet (who seem to be up to nearly every Future feature on earth) and the packing machinery comes from a variety of sources. It depends on the dairy's requirements (quantity of full automation and variety of products) and the amount they are prepared to pay.

AMIGAS Telexplus software — written in Amiga BASIC and compiled with the 68000 compiler — allows the operator to lay in orders, view the goods list, print customer details, display a transport summary and much more. The software speaks to you at every stage, and even signals the orders entered to avoid mistakes, which appeals to the operators. As the system works under the Amiga's multi-

tasking operating system, one operator can perform various tasks almost on one machine, and several operators can share the same data as the whole system is robotised. Usually three or four Amigas are networked — although there is no limit to the number that may be added.

The packing robot takes the sales data and decides which product needs packing and how much of each product is required; the robot and data is automatically from selecting cartons, to filling, to heat sealing, to shrink-wrapping.

■ Many industrial robots like this, are used to control various stages about around the country. Richard de Blais (founder of AMIGAS) uses Amigas to control three, usually three or four units, which worked 4,000s. The packing Telexplus software accepts the orders and the robot decides how much, and when, required packing.





THE ROBOT BOOK

For an informative read, packed with colour pictures of robots being used in almost every conceivable application, try the Robot Book by Richard Pauson, MD of PRL.

Although a little out of date (published in 1985), it is still very interesting (ISBN 0 71 52 041 44). Many thanks to Richard Pauson for giving us permission to use some of the pictures from his book in this article.

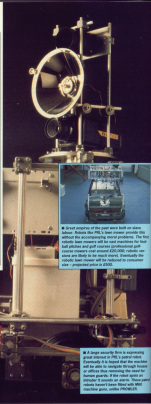
PERSONAL ROBOTS

One company that has put history on the map, for a reason other than its name, is Personal Robots Ltd (PRL). The company was formed in 1984 by Richard Pauson - former editor of Microcomputer Printout, Business Micro and Home Computer Course magazines - and specialists in the research and development of robots technology. Rather than manufacture their own robots, PRL licenses them to other companies.

Applications for large robots are very limited - paint spraying, packing and so on - which is why popularity of the personal robot has soared. Personal robots include educational aids, toy robots, exoskeletons, telechairs, domestic robots and fire-fighting robots. PRL are great believers in all aspects and have probably done more to push the development of small robot than any other company.

PRL are currently working on robot navigation systems, security robots and robot vision. Already they have Robotkit, a modular construction system, for engineers and research scientists to design and build their own robots with the minimum of effort. A software version of this will be ready in September for the 286 users as this latest PRL aren't just into the serious side; they have done some starting work on toys with artificial intelligence, and one of these creatures even made it onto the Wigan show.

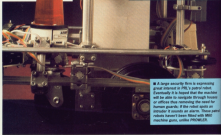
If you're a follower of *Tomorrow's World* then you have probably seen other PRL products like the autonomous patrol robot and robotic lawn mowers.



■ Great emphasis of the year was built on slave labour. Robots like PRL's lawn mower provide this without the accompanying moral problems. The first robots lawn mowers will be used machines for fuel cell phones and golf courses (professional golf-course mowers cost around £25,000). Robotic lawnmowers are likely to be much more, eventually the robots lawn mower will be reduced to consumer size - projected price is £300.



■ Pauson's point: these research vehicles can represent technology in miniature (most like humanoid).



■ A large security firm is expressing great interest in PRL's patrol robot. Eventually it is hoped that the machine will be able to navigate through forests or offices thus reducing the need for human guards. If the robot spots an intruder it sounds an alarm. These patrol robots (PRL's Green Rover) with 1000 machine guns, unlike PRL's Green Rover.



■ **Stay in Australia**
can you find such a robot. Designed as a non-stop cheap cheer-er, the robot—although slower than its skilled human counterpart—the robot takes around 1.5 minutes to complete the job—then a control computer containing an image of a standard object in its memory. The robot's steering head turns fourty degrees to detect variation in cheap cheer. Few ever know where the next cheer is coming from.

ST AND AMIGA IN CONTROL

What better way to understand how a robot works than by controlling one from your micro? For £390 RDR 0629-793294 can supply you with the Amiga Home Control System. This computer interface lets the same box that connects Amiga to multi-thousand pound parking robots and software.

The software has been geared towards home security. It allows video cameras and other sensors to be connected to the interface and, if certain occurrences occur (like someone jamming the front door) has the power to force the computer to phone the police or any other number of your choice, assuming you have a modem attached.

The possibilities are endless and not restricted to home security: eight input and eight output channels are available, modern and garish switches are provided and an optional main modem can be fitted to the interface. The main module allows you to communicate to other devices via the main, high frequency signals are sent along the main cable. Typical uses include switching lights on and off, limiting the late TV viewing and controlling other household appliances.

Cable Electronics (0962-744009) manufacture an interface and robot arm that can be controlled from an Amiga. Price for the arm is £29.99 while the interface and control software is £25.

RDR 0690-5550211 are the only company to come up with a robot control system for the old Robotron II, which is a cut down version of their professional modular construction system, is made up of an interface and software. The firm price has been set, but it is likely to be around

£75. The system is designed to control large robot arms and suggests prices for Lego kits starts at £400. Robotron is being aimed at the educational sector, although there is no reason why home users shouldn't benefit from it too.

The software (PROSC) - written in C - has been ported from IBM based Compaq and suitably modified. In its simplest form, Personal Robot Operating System and Environment allows the user to attach icons to graphic representations of the robot and, by tagging commands to the icons (like move forward for three seconds), the robot can be manipulated in a manner that is both

intuitive and fun. It is one of the more advanced subjects that PROSC addresses.

Robotron is due for a September launch - look out for a full review of this remarkable setup in a future issue of Format.



■ Richard Parnham, ably assisted by a hand, demonstrates Robotron II.



■ It might live longer, but the Japanese guide robot will still slow your team that once more than buying £80 guide dogs for 10 years. The robot guide can carry loads, avoid obstacles and communicate with its owner via the touch.

STS AT TVA IN USA

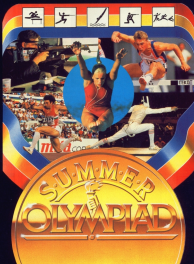
The Tennessee Valley Authority in Chattanooga, USA, provides electrical energy for millions of houses and companies in the surrounding area. Their exhibition centre - detailing how their numerous nuclear power stations work and the methods used to bring electrical power to so many houses - uses a massive pair of robot arms controlled from a ST to point to various objects in the exhibit.

Two engineers, John Hesterman and Mark Munday, took over a year to design the robot and

writing control software. The project was started from scratch as no manufacturer could offer a robot kit. Around 20 STs are used in the exhibit, the majority are hooked up to information presenting touch screen displays. The ST looking after the robot has a hard drive used for storing digitised cartoon videos for its use.

The team involved in the work decided on STs because, at the time, no one was selling comparable machines at such agreeable prices.

SUMMER RELEASE



The request to the Supply
Department has been
forwarded to the
Department of the
Army and Navy
Department.

[illegible]

Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

[illegible]

Year	Country	Population (millions)	Urban population (millions)	Urban population (%)
1980	China	959	190	19.8
1980	India	854	110	12.9
1980	USA	226	140	61.9
1980	USSR	246	100	40.7
1980	Japan	123	90	73.2
1980	France	56	37	66.1
1980	Germany	61	40	65.6
1980	Italy	57	37	65.1
1980	Spain	40	26	65.0
1980	UK	56	40	71.4
1980	Sweden	9	7	77.8
1980	Switzerland	3	2	66.7
1980	Netherlands	16	12	75.0
1980	Belgium	10	7	70.0
1980	Australia	18	12	66.7
1980	Canada	28	18	64.3
1980	South Africa	29	18	62.1
1980	Argentina	27	17	62.9
1980	Brazil	147	80	54.4
1980	Mexico	92	48	52.2
1980	Colombia	23	12	52.2
1980	Venezuela	22	11	50.0
1980	Chile	12	6	50.0
1980	Peru	24	12	50.0
1980	Ecuador	8	4	50.0
1980	Bolivia	7	3	42.9
1980	Paraguay	5	2	40.0
1980	Uruguay	3	2	66.7
1980	Puerto Rico	2	1	50.0
1980	Guatemala	6	3	50.0
1980	El Salvador	4	2	50.0
1980	Honduras	3	1	33.3
1980	Nicaragua	2	1	50.0
1980	Cuba	11	6	54.5
1980	Yugoslavia	23	15	65.2
1980	Czechoslovakia	16	10	62.5
1980	Poland	33	20	60.6
1980	USSR	246	100	40.7
1980	China	959	190	19.8
1980	India	854	110	12.9
1980	USA	226	140	61.9
1980	USSR	246	100	40.7
1980	Japan	123	90	73.2
1980	France	56	37	66.1
1980	Germany	61	40	65.6
1980	Italy	57	37	65.1
1980	Spain	40	26	65.0
1980	UK	56	40	71.4
1980	Sweden	9	7	77.8
1980	Switzerland	3	2	66.7
1980	Netherlands	16	12	75.0
1980	Belgium	10	7	70.0
1980	Australia	18	12	66.7
1980	Canada	28	18	64.3
1980	South Africa	29	18	62.1
1980	Argentina	27	17	62.9
1980	Brazil	147	80	54.4
1980	Mexico	92	48	52.2
1980	Colombia	23	12	52.2
1980	Venezuela	22	11	50.0
1980	Chile	12	6	50.0
1980	Peru	24	12	50.0
1980	Ecuador	8	4	50.0
1980	Bolivia	7	3	42.9
1980	Paraguay	5	2	40.0
1980	Uruguay	3	2	66.7
1980	Puerto Rico	2	1	50.0
1980	Guatemala	6	3	50.0
1980	El Salvador	4	2	50.0
1980	Honduras	3	1	33.3
1980	Nicaragua	2	1	50.0
1980	Cuba	11	6	54.5
1980	Yugoslavia	23	15	65.2
1980	Czechoslovakia	16	10	62.5
1980	Poland	33	20	60.6
1980	USSR	246	100	40.7
1980	China	959	190	19.8
1980	India	854	110	12.9
1980	USA	226	140	61.9
1980	USSR	246	100	40.7

100



TYNESOFT
COMPUTER SOFTWARE

Addison Industrial Estate, Blaydon,
Tyne & Wear NE21 4TE
Tel 0911 414 4611

SCREENPLAY

As the Autumn rush gets under way, our mailbag of goodies just gets bigger and bigger. Undaunted, intrepid reviewer Andy Storer pulls out the best.

In the past month, **FORGET** received 27 fantastic games for review. 10 of these were released exclusively for the ST, 8 for the Amiga. Add to this a further 10 budget 8-bit conversions marketed by Atari itself and you have more releases than most products can reach. So how do we choose the best? I'd like to say we read every review those games that showed **DEPTH**, **STYLE** and **IMPACT** and we're sticking to our word.

GAMES INDEX

FORMAT GOLD

Whirligig Fantasy	46
Space Harrier Lite	48

REVIEWED

Sky Chase Imageworx	52
Revenge of Bob Impulse	53
World Tear Golf Electronic Art	54
Morville Manor Lankhor	56
Empire Strikes Back Domark	57
Better Dead Than Alien (Electra)	57

Format Gold

There, **REVELATION** and you there **LIGHTSOURCE 3D** - a lot of style, a lot of impact - we're taking **REALISM**, or at least an approach to it, given the fact that you're wandering around **4,294,967,296** environments looking for **PERFECT SOLDIERS**. Since it took western artists at least 10,000 YEARS to work out perspective it's good to know the bugs from Mannheim took only a couple to get **SCARABLE SHADOWS** up and running. Let's hope the coding catches on.

And so to **SPACE** - **WARRIOR**, our other **FORMAT GOLD** winner. Here we're taking **IMPACT** to the 10th degree in a special scenario set in outer-space where, plenty of **STYLE** kicking around, you're there too - some of the **SHARpest SPIRITS** you're ever likely to catch a glimpse of. So it's an **EX-AMORCE**.

FASTBLAST that got played to death while the performance lasted, but when you seen the speed at which it shifts? Even now, its **TECHNO-GRAPHICS** are way out in front when you consider the expense would have cost going on for 3 Mbytes and 3 processors. Can't wait for the longer version.

And the rest...

MINDSOFT announced a new software label the other week and first off the launch was **DRY DANCE**, a combat game lying in from the States. It's a two player dueler it's **PRETTY DAMN BARE**, and you'll be pleased to know its vector graphics are clear enough to be able to distinguish between an F-4 and an A-10.

After one French software house tested all month for the **LONGEST LIQUID LUNCH** EVER the other weekend, we decided enough was not enough and went off to **LAWYER'S OFFICE/MORTALITY**. The way the French pack you mark onto one disk is a mystery in itself - we know they love their language but to teach the sound chip to speak in French is the kind of **FRENCH LESSON** we could all do with.

On the other hand, **BETTER DEAD THAN ALIEN** is a lesson in moderation. That's to say how long can you go without booting it up and totalling every form of life you come across? While it may not be at that original, the **EXECUTION** is wonderful. **TAKE A BREATH** to join the search for life as we don't know it. And then wait.

Which brings us to our final choice, **Pill SPINE STRIKES BACK**. The pin head is quite straightforward - shoot everything in sight and wait for the sequel. **NEXT TIME GIVE US MORE LEVELS, LADS!**

Oh, and just before you turn the page, a final word on our reviews. Below the picture we have a couple of boxes showing machine, mode of play and price. So, just to make it clear - the White box is the version of the game we've reviewed, blue.

Now turn over and get stuck into **WHIRLIGIG** - don't get yourself in a spin...



CLOSE... BUT NOT THAT CLOSE

So what of the games that didn't get reviewed? Here's just a few honorable mentions: **OVERLANDER**, **PIRE AND FORGET** and **RACEY BOY**, all released for both machines, are pretty standard in terms of gameplay and graphics - except in **RACEY BOY** there's no **BURN-UP ROCKETER** violence involved. All are great fun, for a while.

Hooked together under a sporting umbrella (is it Summer again already?) - but were **FOOTBALL MANAGER 2**, **PETER BEARDLE'S INTERNATIONAL**

FOOTBALL, **WORLD-CAMEL**, **WORLD-DARTS**, **ROCK FORTRESS**, **SUPER SAI**, **SCARABLE ON LINE** and **CRIMED ROULETTE**. You can find out all you want about these by reading their box covers.

Then there's the outstandingly understating ones. **EMPOYERS**' box cover looked great, and **CRIMBY GRIFFIN** had great fun taking the s out of the overweight - we couldn't see the joke. As for **ORGANOID**, well we're sure **OCEAN** will just love it. Why didn't **SCA** call it **ORGANOID** and remove any confusion.





WHIRLIGIG

NAME: STUDENT ID:

Copyright © 2004 John Wiley & Sons, Inc.

[illegible]

If you spent one minute visiting each of the 4.1 billion sectors of Telecom-suff's latest 3D epic you'd still be playing in 81,73 years (and! And if you reach that's daunting, then imagine a game where you have no fewer than 100,000,000,000 enemy ships to blast away at in an attempt to reach the maximum possible mission score of 4,296,976,295. And even then you would have lost. The winning score is infinity.



CAMPPLAY

The "Whodunnit" is a cool rehash of space-fic (think of "Voyagers!", comprising stars, asteroids, planets and alien vessels, linked by numerous star-galaxy. It forms a pattern based on prime factors and "perfect numbers" - the aim is to trace the trail of these numbers in a search for "perfectness" where you trace the route and collect it on the right side.

A perfect number, once you ask, is a number that is the sum of all its divisors excluding itself and, unfortunately, there are only four of them below 40: 6, 28, 496, 8128 and $33,550,336$. But 1, 2, 3, and 4 are the divisors of 6, that, huh? These are the reference numbers of the perfect aliquot series you're after. (Don't panic if you learned your last maths exam though - finding doesn't demand any particular expertise, although there are shortcuts open to you if you can solve some truly hard number theory.)

You don't need to work your way through all those results one by one. The underlying matrix of the strategic network shows you the leap through millions at a time. You can arrive at sector 105-0116 in less than 30 leaps. Whether you'll have visited the other perfect spaces in the process depends on whether you're your subconscious friend, foe, or...

Within each of the five performances, you'll find a single floating heart set solid, standing at a distance

Now, then cube, octahedron, icosahedron and dodecahedron which you must lay through a straight line capture. Once you've collected all five, you've achieved the perfect score! Sample 40!

Winston. Along the way there's a whole host of alien animals, some hard, some crustal (for instance). But not to make you feel too free to think about their mating scenes. Your fans have obviously perfected their climbing devices — although your pop-out control and rubber panel will reveal the position of stingers, feet and arms (clamps, you don't see any alien until you're again in front of you). Your adventures have their own slice of sci-fi fun. And yes, don't leave it.

Two aerial canopies of fuel-roasting, monkey and chaff pots mounted around your cockpit and fuel, run progress through a sector is best treated with care – especially as your monkey has fuel so much that if you miss your target you'll still come sailing home with a big Hello. Chaff pots are often the best bet as they simultaneously deflect any incoming missiles whilst hiding any target in the vicinity with noise. But, as with fuel, good luck to maintain your stocks regularly, and finding sectors that contain either or both can lead you away from your planned route.

GRAPHICS AND SOUND

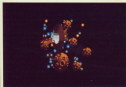
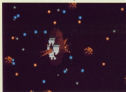
Shadows are no new departure for solid 3D - graphics programmers realised years ago that shaded objects look much better with a corresponding shaded area beneath them. In *Parsons's* other recent release, *Wind*, ground shadows play an integral part in the gameplay - for close proximity combat it's essential to refer to the position of the shadow cast by an aerial opponent.

In following the reading, readers learn an off-screen cultural source like a fact and so, in a sense, incidental social attitude and relative position have no meaning. (Shadow is confined to the signified shell). It has no form-like value that to illuminate and affect a reader to understand its work. This is an object

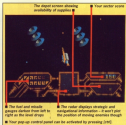
achievement beautifully implemented and serves to elevate Lightroom 3D as a feature which should form the basis of all future solid 3D releases. It's a commendable 3D achievement.

Fip than that the mouse handling is slick. Directing your ship is more than a quarter of an inch smaller than the rest of the world.

Sound is also disappointing. The background music could be described as a slightly dulled rendition of a Porgy version of the Captain Porgy's theme playing at 18 rpm. What space-effects are present merely hint of impending attack from the coast of alien worlds.



■ You head towards a Stargate and space explodes as you enter



■ You move closer to a couple of depths to stock up on missiles and fuel



■ You've evaded all alien opponents and found your first Perfect Shot - a Interceptor. You must see it through the Stargate to make sure it's yours though. Only it means to go now, but you could be searching for quite a while... The first Perfect Shot is an *Interceptor* 3300000

CONCLUSION

Despite a gameplay which inevitably begins to grow 3D graphics which are full of this world and a background which is truly grand, there's still an extended searching, missing from playing. It has the depth, yes, but not the breadth to be a true classic. There simply aren't enough different things happening for it to be considered as anything more than a graphic exercise for excitement. But for the moment, that's enough - *Lightforce* 3D games have made their debut with style.

3D graphics

1 2 3 4 5

moving graphics

1 2 3 4 5

sound effects

1 2 3 4 5

testing interest

1 2 3 4 5

overall 84%



SPACE HARRIER

ELITE

ST - £19.99. Mouse or joystick

Amiga - version imminent



Two years ago the star of the PCN show was a Sega coin-op more accurately described as a chicken. Queens for a ride on this low-slung jet bike with monitor for windscreen caused severe congestion and a number of punch-ups. When *Space Harrier* hit the streets a few months later the effect was the same. Arcade life shifted into overdrive. Now you can forget about all the other punters and jet around the galaxy from the comfort of your own chair.

■ (1) These chaps are really losing their heads over nothing. Better give them a taste of their own medicine.

■ (2) Make room for the mouth-rooms... you fly above the action but what thanks do you get? Make sure you don't hit that tree.



GAMEPLAY

The aim of *Space Harrier* is to save the land from the dastardly perils of supernatural phenomena. This wouldn't normally put the two named liberators among you, except for the fact that in this case your opponents are approaching the supernatural and, despite being able to fly for long periods, you need to keep your feet firmly on the ground to cope with the rush of images hitting you. With the concept you got three hits before you had to delve into your pocket again - now you have three times as many chances to get used to the manoeuvres. They're not enough.

There are two levels of frenetic action as you try to dodge and destroy all manner of surreal flora and fauna. The speed of movement is electrifying - distant objects accelerate toward you at frightening pace so you run, leap or fly to a limboed horizon. Each level begins with a bottle against a host of flying dragons - each with stone statue heads, swirling black mist, floating fly-agaric and motleyed marionette war machines among them - some in spiral formation, coming at you from all directions, long winding necks rippling. To make matters worse, the landscapes feature obstacles such as fields of stone columns, towering boulders, mutant cygnets and day-glo pineapple bushes which you must weave and jump around like you'd just had half a pint of liquid nitrogen poured down your trousers.

Levels conclude with prolonged combat against such unworldly adversaries as chariot dragons breathing balls of fire, rearing native apes and giant banana plants going just nuts on you before the real run-stop frenzy is loaded. And what have you got to counter this heathen horde with? A mouse. That's what. In other words, go completely insane with the fire button and blast everything in sight.

Thankfully, mouse control is extremely responsive which is just as well since half the time you only seem to receive one due to several responses. Some levels require hand movements so fast you could smash your desk top. As there's no auto repeat on the fire button your forefinger takes a bit of a hammering too. As for your eyes... well it's probably best not to go out driving afterwards unless you have a Lamborghini and at least half an astronaut at your disposal.

To take a break from continuous firing you need only hit Escape and you can continue play on a frame by frame basis - useful if you're unable to master a particular sequence. But beware: you can't actually go through an entire level on this slow frame by frame observe. If you try, you are unceremoniously dumped back to level one. Hit Escape and you're returned to the rigours of real-time. Playing with the mouse is easier than with joystick, since response is much sharper - and you'd better believe it, reaction is what this action is all about.



■ (3) Blooming hell... A bunch of flowers get ready to spray you



GRAPHICS AND SOUND

Shunning *Space Harrier* was pretty hot in the arcades with its custom hardware drivers, but on the 16-biters you'll still be surprised by the speed at which those huge sprites come hurtling at you. The transition from a small distant speck to a massive full-screen presence is like whipping a room fan to the max. They're almost too fast.

But it's not just a question of shifting around any old bunch of sprites at lightning speeds. The artwork is superbly detailed with great attention paid to the overall visual character of each level. Combined with the mammoth scrolling landscapes, the game positively screams style. It's as if all that arcade action has been squeezed into the small screen. The objects you're up against are depicted just as brightly and seem to move just as quickly as in the coin-op.

The sound doesn't quite match the graphics for style, and is confined to an everpresent backing track intersub with the regular chirp of your character as he gets his head-on once again. But it's visual action that counts in this one and *Space Harrier* is an object lesson in how to simultaneously shift large chunky sprites at impressive speeds.

■ (4) Things begin to get a little tricky as robotic *Satanst* decide to get in on the act. It'll be all too easy to connect last-but not with these guys around.

■ (5) This characterless two-headed dragon proves quite an adversary.

CONCLUSION

By the time you've reached the fifth level and nibbled the back of a dragon you'll be hooked on the spectacular action of *Space Harrier*. Because of its high quality graphics content, you just can't write it off as arcade fare. If reality is an excellent conversion and its screen velocities alone should ensure equally fast sales. Get Ready!

100% graphics



moving graphics



sound effects



testing interest



overall 83%



■ (5) Five breathing butterflies flutter by in high-speed attack formation. Just when you thought things were making up some of their friends arrive.

AMIGA

£24.95



FUEL FOR EN



Your plane has ditched on a mountainous plateau somewhere in deepest Tibet. You and your companions are alive. A large shape moves toward you, you rub your eyes in disbelief, a dinosaur! — where are you... and what? Stunning, monochromatic 3D graphics and 4-way scrolling, give that '80's cinema mood as you learn not only to survive, but also that your companions are not all they first seemed!



FROM
ocean



Digitised graphics, referencing from full-colour photographs of Daley Thompson himself, take full advantage of the Amiga's and the Alan's capabilities giving you a taste of all the art sports simulation. Featuring an optional game play which allows you to 'work out' in the gym where your performance will directly affect your performance in the final events themselves — another first for Ocean!



FROM
ocean



Dynami's attention to detail and superior graphics presentation add an extra dimension and Army Men is no exception. A full blown shoot-'em-up tale you'll savor several times when you will take command of first an armoured jeep, then helicopters and finally, on foot as you make your way through the jungle to the enemy's headquarters ultimately to seek out its destruction.

FROM
ocean

16 BIT STATE

ATARI
ST
£19.95

ENTERTAINMENT



Exceptional graphics, innovative game design and digital sound all add up to recreate the atmosphere generated in the box office smash hit. Closely following the original storyline (you save your platoon, selecting individual men for engagement, who will encounter the enemy another many bloody traps as you needs to find the enemy underground headquarters). The strategy of the series of forward movement, naval base and a submarine - your enemy will range from, from beneath the water which find the submarine, meeting enemy bases... the atmosphere built enough to kill!



One phrase sums up the success and appeal of Arkanoid - "It's just there another go!" Arkanoid is addictive! Using all the capabilities of the Atari, more this convention is almost an exact replica with all the excitement of the original! Take your smash hit. Thus Arkanoid - Egg blockbuster.



FROM
ocean



OF THE ART



SKYCHASE

IMAGEWORKS

Amiga - £19.95, Dopeltok only

Atari ST - version out soon

The first release from ImageWorks' new label ImageWorks is an air-to-air combat simulation imported from the States. Modelled on US Air Force and Navy flight school training competitions, Sky Chase offers would-be ace a choice of seven aircraft with which to engage in head-up confrontations

against another player or the computer.



■ You're about to get loaded by a robot paper-plane's missile.

GAMEPLAY

Sky Chase provides simple, fast action, no nonsense delights - immediately. There's no need for lengthy explanations across empty air space to find an opponent - at the beginning of each carrier the aircraft collides with its head-on is a fly sequence. From then on it's down to checking the radar whilst you grip that joystick and side the Jo.

You can choose between playing as F-14, F-15, F-16, F-18, MiG-27, MiG-31 and, for the kamikaze among you, a paper airplane. Origen can take on a whole new meaning as a paper fighter under computer control takes on your F-15 and sports out the real meaning of pulp as you hit the deck with around 2 tons of lead in your chest.

Since there's no penalty for flying round (you have unlimited fuel, ammunition and air-to-air missiles), you may as well just go out there and have some fun. Once you have your opponent in view, a sighting appears center-screen and you can burst off some cannon. As you get nearer, a targeting box comes into view and you can double-click fire to launch a missile. Once locked on, the missile finds its way home with steering devices.

When you're on the receiving end, the only way you might escape such inevitable destruction is to perform some evasive maneuvers by hitting the shift key to switch up the thrust and fend to wily that any real fighter would find its body-frame strain across these confrontations. Needless to say, the kind of evasive action is best left to those experts for whom Top Gun and Firefox are busy outings on a Sunday afternoon.



■ A near head-on collision between two MiG-31s at several Mach.

GRAPHICS AND SOUND

There are no solid 3D graphics here to give you a realistic impression of flight but then that's not the real point of Sky Chase. What you have instead are smooth vector-graphics deferring fast screen updates of combat action. Speed, rather than realism, is being emphasized to compound thrills and spills.

The flat grid world over which you fly can be altered to display 49, 225, 961 or 3600 squares and, the wireframe handling does or quickens accordingly, with just a 49 square grid and a couple of F-16s, the action is very very fast. However, because the world below is dark and featureless, and for most of the time you don't look at the instrument panel for fear of missing a fatal shot, judging your altitude can be a touch tricky. At low altitudes, the only accurate measure of your height is whether you're still in one piece or not. Ground surface rendering would have improved this, to some extent but probably only to the detriment of speed. Alternatively, subtle warnings could have been used, but what if there are in no way functional.

CONCLUSION

Duoscreen aerial combat simulations are something of a rarity on any machine. On 16-biters, Sky Chase is a first. If the graphics detail were more substantial we'd be dealing with something very special. As it is we're looking at an above average shoot-em-up employing smooth screen routines to convey the performance capabilities of a range of advanced fighters. Where Sky Chase really scores though is in its provision of one-to-one combat for two players. When you're up there with a friend as your foe you won't have time to analyze the graphics.

still graphics

0 1 2 3 4 5

moving graphics

0 1 2 3 4 5

soundtrack

0 1 2 3 4 5

lasting interest

0 1 2 3 4 5

overall 78%



■ You've just hit your opponent with a spray of cannon fire

ARKANOID - REVENGE OF DOH

PETER JOHNSON/IMAGINE

ST - £19.95. Mouse

Amiga - £19.95. Mouse. Due this month.

The original 1986 Atari coin-op conversion convinced an awful lot of people that Breakout had really broken out for the final time. Yet Arkanoid's appearance on the 8-bits did more than spare

Crack, Impact, Twin! Titles and, more recently, Ciganoid. It paved the way for video and sonic overhauls on 16-bit reimaginings that transformed Breakout beyond all recognition.

GAMEPLAY

In traditional style, you use your mouse to move a bat from left to right to deflect an enemy ball which will gradually break down the brick walls confronting you. Certain coloured bricks must be hit more than once and some are completely indestructible. Some are hit and disappear only to return again later, others begin to move from side to side. From the top of the screen emerge a host of animated asteroids which serve to act as random deflectors - sailing, tumbling, moving molecules and bouncing balls among others - which are fortunately eliminated on contact with either the bat or ball.

You are aided in your attempts to clear the walls and proceed through the 64 levels by an assortment of capsules released upon destruction of the bricks they're hidden beneath. You must slide your bat to catch them and thereby benefit from their various properties. Each capsule is marked with an initial denoting its power. Revenge of Doh gets one over its illustrious predecessor in that there are now far more of these special features: if you're feeling really in form, you can have up to eight balls in play at once, have them break through bricks without bouncing off them, or split into three separate regenerating balls. In addition you can have twin and ghost bats in play, including a special pet which bestows a random effect, there are now 12 featured capsules.



▶ Shining backdrops make Revenge of Doh a visual treat

GRAPHICS AND SOUND

Super-scaled backgrounds and dense brick arrays place Revenge of Doh very high in the graphics stakes. Animation of the various moving obstacles is super smooth but the ball itself suffers from a slight wobble. However, up to eight balls can all move simultaneously with no apparent loss of speed, so this wobble is a small price to pay for the vast amount of update information being processed

when all ball break, bounce on screen. It doesn't detract from the overall appearance or the game play.

Spot sound effects only add atmosphere to a game of this visual quality, and serve to remind you from computer and other monotonies. The world outside with when you tune in to this one.



▶ Here there's seven balls on the go at once, but if you collect the right capsules... The effect is immediate



▶ These bouncing ball obstacles make this level almost impossible



▶ Other capsules give you effects like multiple bats with split

CONCLUSION

The main effect is the gameplay transition, what would otherwise be a straight breakout clone into a thoroughly competitive classic. Every new game has scores of sufficiently random capsules to ensure a level of addictiveness that many games claim but fail to deliver. Revenge of Doh cuts code you'll come back to time and time again.

8001 graphics



moving graphics



smoothness



interesting interest



overall 80%

WORLD TOUR GOLF

ELECTRONIC ARTS

Amiga - £24.95, joystick or mouse

Amstrad 517 - no version planned

The first golf simulator was a small tin tray used to be lying around the corners of executive offices. Later models got sophisticated - they shot the ball back to you. Which was all very well for your putting, but when it came to driving how could you possibly get into the swing of things?

Okay, so no golf simulator can really help you master your swings, strokes and putts, but it should give you a good idea of what club to use and when. World Tour Golf does this and more - better than you look off the screen than into the real rough.

GAMEPLAY

After choosing a course from the 24 available, you can select up to 4 golfers to take part in a 32 hole tournament. The default characteristics of certain named famous professionals - Jack Nicklaus, Curtis Strange, Fuzzy Coster and Arnie Fanny - can be modified to alter drive distance, accuracy, tendency and recovery skill. Random factors affecting wind speed and the state of the greens are then introduced which ensure no course is ever the same twice. In fact you can expand the possibilities further with the course construction menu, allowing you to add, delete and copy holes from other courses.

On the left of the screen is a bird's eye view of the first hole complete with fairway, green, bunkers, trees and water along with a cursor indicating the default direction of the first drive. You can change the fly simply clicking in an adjacent area of screen. Over on the right is a more detailed view of the immediate locality of the tee off, and also course, hole and club information.

Clicking once on the right window brings up the swing meter - the strength of your shot is determined by the amount of time you allow the swing bar to move. Clicking at the desired moment freezes the disintegrating and reconstitutes a further click to establish accuracy. Clicking too early means you will slice or fade the drive whereas if you're too late you'll hook or draw it. Once you're connected, you see the ball disappear into the distance on both screens.

The swing meter is an ingenious means of simulating a stroke although it doesn't teach you how to do real thing (at least when a shot goes wrong, you don't have to crawl on all fours in the rough looking for the damned ball. Putting is similar since you just press a numeric key to send the ball a corresponding distance.

GRAPHICS AND SOUND

You wouldn't really expect sound on a golf simulator would you? Apart from the thwack of the ball being hit, the only other sound effects you'd be likely to hear in the real world would be of the fair field variety. That and the clumping of armoured treading for cover. It's no different here - the air around your monitor will turn blue too. Down on the screen, the predominant

colour is, of course, green. The courses are beautifully drawn, with the variety of trees and bushes particularly well crafted. The animated movement of the golfer flows smoothly as he swings a stroke and if you make a bad shot a 'gimcrack bubble' appears. Some of the more exotic courses - with names like Guffy - have holes that could only feature in Disneyland.



■ You're just about to drive



■ The swing meter shows you're just about to hit that ball at full strength



■ Editing a course.

CONCLUSION

Definitely a game for these days when you've been wiped out, which gives you new conditions in the UK should be at least half the time, and a great way of practicing your theory without leaving your armchair. All in all, there's no handicap here to having a very enjoyable game.

still graphics	0 1 2 3 4 5
moving graphics	0 1 2 3 4 5
soundtrack	0 1 2 3 4 5
loading internet	0 1 2 3 4 5
overall 78%	

OBLITERATOR

[illegible]

Thyssen (Berlin) Ltd of the GDR, a large, government-owned and government-financing machine tool manufacturer for the production of machine tools and machine equipment for the metal processing of machine tools.

Native seeds of *Polypodium* species are **allopathic** (and **allo** means "other"). It is a drug of **toxicity** and **bordering** (poison) **Polypodium** (**polypodium** comes from Greek). Northward exposure, there is **other** (**polypodium** goes **other**).

[illegible]

SOLUTION: (A) 134, 135

Online Resources www.pearsoncmg.com www.pearsoncmg.com

- | | |
|-----------------|-----------|
| Terrapins | — \$24.95 |
| Barbarian | — \$24.95 |
| Deep Space | — \$24.95 |
| Arson | — \$24.95 |
| Stratocaster | — \$24.95 |
| Arson/Terrapins | — \$29.95 |

Address: 10000
 City: 10000
 Country: 10000

PSYCHOLOGIA

FREEPOST
LIVERPOOL L3 3AD
UNITED KINGDOM
Telephone: 051-335 8819





MORTVILLE MANOR

KYLKHOR CREATION/LANRHOR

Amiga - £24.95, Mouse, Reviewed

ST - £24.95, Mouse, Due August

France's 1987 Game of the Year and biggest seller apparently shifted twice as many units as its nearest rival, and now hopes to pick up a few

accolades here too. If you've ever played and enjoyed Bernard Time, Deje Vu, Witness, Conspire or any other whodunnit, then Mortville's for you.

GAMEPLAY

You play the part of Jerome Lange, a fugitive clone private eye who's received an invitation from an old friend to join her at Château Mortville to help with a desperate situation. With a name like Mortville you might suppose something is seriously wrong and, yep, you're right. Your old friend Lila has already departed. To Deadville.

Arriving in a clinic, you are met by the butler who gives you a tour down the place and its inhabitants before showing you to your bedroom. From there on it's entirely up to you. You may wander around the various rooms and the grounds outside, the area being to search for evidence and find a variety of objects which may lead you to the murderer in your mind. There are eight characters on whom to pin Lila's murder; you may question these suspects directly about the background to the case and, as you progress and locate evidence, grill them about their alibi.

Discourse will make your task a lot easier. It's hard to choose evidence secretly before confronting your chosen suspect. As, of course, everyone's guilty until proved innocent and it's quite easy to have a knife plunged in your back when all you're doing is exploring the attic.

No, who did commit the crime? Well, it's got to be the one person it couldn't possibly be.



■ You've just unpacked and where to go first is a complete mystery



■ Someone's study: shall we have a look in the desk drawer?



■ A parchment just happens to be accidentally untied in your hands

Mortville is a mouse driven adventure using a unique method of conversing with other characters. Discussions are selected by clicking on the name of the person you wish to talk to, and a screen then appears showing a range of discussion topics appropriate to what you've discovered at that point. You click on one to hear the reply, and one really does hear it, in an outrageous French accent.

Actions are determined from pulldown menus. Enter a verb in preterit and responded to

immediately - you click on 'speak' and a door does therefore, or the verb requires further qualification - you must move a curtain over the object to which you wish to apply your action and click to



■ This screen appears each time you want to converse with a character. You just click on the topic of your choice and are returned to an animated talking head for the reply

GRAPHICS AND SOUND

Fast action and speed is depicted by simple but effective graphics, nothing an £44 million couldn't put on screen. What makes Mortville really unique is that the characters really do speak to you, complete with animated faces as they deliver their message. Nothing more about speech in a game, you say, but eight characters talking clearly in thick French accents! Genius! There's a staggering amount of speech crammed onto the disk, far too much for it to be listened - the game is entirely using the Amiga's speech synthesiser chip directly, so how it'll work on the ST is anyone's guess.

As to the result of high quality effects to supplement dialogue - short musical events, doors swinging smoothly open, foot steps, closing doors - and you're talking. Amusingly, the big essential of any adventure.



■ Last paper up to speak

CONCLUSION

It'd be a sound decision to add Mortville to your adventure collection. Although the plot is a little cluttered, the method of interaction and sense of involvement are compelling enough to make up for this. And then again, it's great just to listen to all those lovely French accents. Just hope you and so on in French and not Occitan.



THE EMPIRE STRIKES BACK

VECTOR GRAPHICSDOMARK

GF - \$19.99. Mouse or joystick. Reviewed.

Amiga - \$19.99. Mouse or joystick.

So how hard does it strike back? You'd expect something savage, but in keeping with its premise, Star Wars, the action is intense but relatively easy.

This time there are four levels of wire-frame action; you have to blast various protocols before they can transport pictures to the intergalactic evil Vader Blood Heat.blast two types of Imperial Bikes, blast tons of Tie fighters and blast and dodge an asteroid storm.

You have five shields for pro-

tection and a limitless supply of firepower to make up for the force that doesn't seem to be anywhere around. There are three levels of difficulty - each requiring you to blast even greater numbers of Vader's minions.

The vector graphics have not been improved to any great extent. There isn't sufficient detail to make them anything more than passable. After the screen is full of small fighters the action is pretty fast but since screen update



■ Blast Vader's plans!

does up considerably when you have more than a couple of the ponderous walkers on screen, graphics routines may as well have been sold in the first place. They would have looked a bit better. And, yes, there's the old burst of sampled sound from the film between levels. But difficulty and feeling aren't there yet.

total graphics 3.0
moving graphics 4.0
soundtrack 3.0
testing interest 3.0
overall 60%

BETTER DEAD THAN ALIEN

SCORCHINGELECTRA

Amiga - \$19.99. Mouse, joystick or keys.

GF - \$19.99. Mouse, joystick or keys.

Not exactly Advanced Computer Entertainment but good fun nevertheless. Better Dead Than Alien is a new wave murder done it there star was one, with some great variations on an original theme added with style and humor. Yes, some of those

aliens really make you sick - literally - they're so damn ugly.

It features 25 levels of woad and wonderful scenarios coming your way, being included is they wonder why human slaughter always takes the form of slaughter. Although they don't respect



■ This guy certainly looks under the weather - better give him a pain-killer to jettison him down.

your precious human they occasionally send you small power periods to help you in your cause. Kamikaze to the last, their gifts take the form of mine layers, new trap bombs, traps, armor upgrades, shields and, perhaps most helpful of all, auto repeat saturation blasts. With enemies like them, who needs friends?

Each level comprises a couple of waves of bizarre invaders leading to an encounter with a Master alien. Words cannot describe the satiating insanity you'll confront, nor the difficulty of attempting to stay alive while you're dying laughing. Digitized laughter greets your successes, and mocking laughter your object failures, together with hundreds of other woad sound effects.

Once completed, you can return to a level by entering a code word thereby allowing you to find out just how ugly the later Master alien is without having to wipe the tears from your eyes. If wholesale slaughter is a favorite pastime of yours you'll find Better Dead a rewarding and satisfying experience guaranteeing hours of savagery in the name of beauty. A truly philosophical encounter.

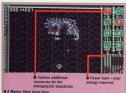


■ Collecting the right capsule gives you double the fun.



■ Beady lies in the eyes of the beholder of an Auto Repeat Saturation Blast.

total graphics 4.0
moving graphics 4.0
soundtrack 3.5
testing interest 3.0
overall 75%



■ Various additional resources for the intergalactic revolution.

■ Power bars - your energy reserves.

■ A Master Alien loses face.



■ The Blue Invader Comes meet Captain Master A.D.



■ Picking up that capsule makes meaningful contact a little easier.

DATTEL ELECTRONICS



AMIGA PRO SAMPLER STUDIO

- A big quality sound sampling system in a medium price.
- 40 samples per second (up to sampling system that supports more).
- 100% software auto calibration for maximum features.
- Stereo sampling.
- Software frequency display.
- Software level meters.
- Real time in CPU load.
- Adjustable (remotely) recording speed and mix.
- Synthesizer sample rate and playback speed.
- Recorder (and) for sampling system play and features with full resources for low resource system.
- Hardware compatible with many other software packages.
- Software for use in real time with other tools.
- Software, may use, also play other with features.
- Monitors and controls (1/2) data and the resources.
- It is not all easy recording. Some other to help your data resources in real time system.

ONLY **\$49.99** COMPLETE SYSTEM, PLANS FROM APPROX 1000/1000



DISK/STORAGE BOX OFFERS

- 5.25" disks to 5 1/4" disks (convert).

ONLY **\$6.99**

- 5.25" disks to 5 1/4" disks (convert).

ONLY **\$8.99**

- Disk - 5 1/4" 5/25/75.
- Big quality built packed with cables.

ONLY **\$24.99** PER SET.



DATA/SWITCH BOXES

- A 7 pin connector (to protect in case connector is damaged).
- Switchable (switch) in 100% (switch) connector.
- 10 pin (switch) data.

ONLY **\$24.99**

- 40 pin (switch) data (switch) in case connector.
- 10 pin (switch) data.

ONLY **\$34.99**

- Switchable (switch) in 100% (switch) connector.
- 10 pin (switch) data.
- 10 pin (switch) data.
- 10 pin (switch) data.

ONLY **\$29.99**

ST COPY - DEEP SCAN NIBBLER

- Copy an entire disk - even highly protected programs - in under 10 seconds.

- Works with any drive or bus.
- Multiple copy option allows you to make many copies from one original.
- Copy 1 or 2 data sides - up to 100 tracks.
- Special threat parameters for non standard formats.
- Using 1000 BT copy a whole disk in one pass with single drive.
- Compatible with 100 and 1000 BT.
- Unique (BPS) analyzer - displays vital disk parameters, including sector distribution, data dispersion, checksum status, etc., etc.
- Full verify option.
- Easy to use from drive program takes the mystery out of disk testing.

ONLY **\$29.99**



DATTEL JAMMER

- To implement the Dattel Jammer (the Dattel Jammer) gives you a 10 second delay in any and record your sampling results.

- 1 and 1/2 inch disks.
- 1 inch segment up to 1000 tracks.
- Design and Test Control.
- Music Studio (in 1000 tracks).
- Load and save options.
- Works on standard (BT) file mode.



MIDIMASTER

- Full MIDI interface for AMIG/1000/1000 (Plesian state model).
- Compatible with most leading MIDI packages (e.g. 10, 1000).
- MIDI to - MIDI Out a 1 - MIDI In.
- Fully type (switch).
- No need to pay more - Full MIDI standard.

ONLY **\$34.99**

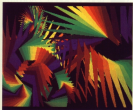


PRINTER CABLES

- 25 pin (17) to 10 pin (switch) parallel port.
- 1000 or 1000 pin state.
- 1.1m length.

ONLY **\$8.99**





■ Forget the technology; this is the kind of image you can produce with the mouse

From VSEQ to KML

Tripe-It is packaged in a binder, designed to appeal to anyone with a taste for personal organizers. The manual runs to some 640 well-printed pages, bound together in tasteful burgundy covers with synthetic leather trim (which involved the death of no models). The program can be run on any ST, though extra features are available on machines with a Megabyte or more.

Minter's main programming strength has always been in squeezing speed into the graphics of whatever machine he's working on. In Tripe-It this isn't displayed as lightning fast sprites zapping everything in sight, but in the number of points he manages to manipulate in real time. Playing with the three demo files supplied with the program immediately reveals the variety of effects you can produce with the unit. The demo files themselves are presents for the curious effects supported by Tripe-It, and are worthy of several hours' play just familiarising yourself with the concept and controls.

Macros and sequences

All the light effects can be executed in real time by calling up the appropriate menu and selecting parameters from it, but for live performance there may well not be time to go through the process. For this reason, and also because it makes the program far more versatile, Minter has included a Keyword Macro Language (KML). As the name suggests, the language lets you assign small program segments (known to just about any key on the keyboard).

What the name doesn't suggest is that these program segments can control just about any facet of the

program. As well as the standard loop and conditional structures of a high-level language like BASIC or Pascal, there are many specific commands for controlling the synthesizer directly. The demo programs are all short KML macros and it's instructive to read through these listings to see how they work. This is not to say that the manual has shortcomings, as the commands are well covered with many program snippets.

will to get the full effect from it - one 14" monitor at a local shop is hardly going to set the village alight.

There's no doubt Minter has an innovative product in Tripe-It, it remains to be seen whether he can persuade the world it's really what they need. No big one, if only to fill a few hours of relaxation, but then for a production for amateurs, tape and most things worthy, Tripe-It could be the start of something bright.

WITH HAND ON MOUSE

Control of Tripe-It is almost entirely by mouse, though a graphics tablet is an alternative for the wealthy. Keyboard control is mainly restricted to entering KML programs and selecting specific effects from menus assigned to single keys. The mouse shows once again how good it is at translating subtle movements of the hand into precise effects on the screen, and the program is sensitive to the dynamics of movement, reacting differently to slow, small movements and large, sweeping ones.

The subsidiary menu (powered liberally with arrow, space and yank) cover disk access, KML set up, the synthesizer, the cityscape, waveform gener-

ator, pattern creator, colour picker, start/end edit, KML, keyboard assignments and video equipment.

There's a sound pretty obscure, but are well explained in the manual, and even seem to slot into place in the overall system.

When actually 'tripping', the colour palette can be controlled from the numeric pad and the degree of pattern symmetry from the cursor cluster. Other special effects can be assigned to keys on the main keyboard from one of the menus. The overall technique is both reasonably easy to remember and very versatile. (Quite commendable in such a complex system).

for

- Easy to use systems, but still open to adaptation
- Very fast and sophisticated graphics displays possible
- Comprehensive macro language for pre-setting effects

against

- Large screen needed for full benefit in performance

features

1. 100,000 points

2. 100,000 points

3. 100,000 points

4. 100,000 points

5. 100,000 points

6. 100,000 points

7. 100,000 points

8. 100,000 points

9. 100,000 points

10. 100,000 points

11. 100,000 points

12. 100,000 points



DISK EXTRA

ST Amiga Format's unique dual format disk gives you the best of both ST and Amiga worlds!

ST

64 POWERDRONE

Electronic Arts' brand new jet-racer game must be the one to end all racing sims. Check it out with our stunning magazine.

65 CHESSNUT

One of the more serious gamers, this. With some excellent 3-D graphics of the chess



board, Chessnut isn't just a pretty face — it plays a mean game too.

66 SPRITE EDITOR

Sprite Editor is a program designed specifically for those of you who program in SPA Basic. Designing sprites has never been so easy.

68 DC CLOCK

DC Clock is another one of those incredibly useful programs that make you wonder how you managed without it. Keeps track of time without ever having to take your eyes off the screen again!

69 CHEATS!!!

Stuck on Star Wars or X-Men? Beat the games with the month's cheats. Who ever said dishonesty gets you nowhere?

AMIGA

64 KIND WORDS

Everyone needs a word processor — try out this exciting new WP in the comfort of your own

Amiga, and see why everyone's talking about it.

66 3D ARM

You've read the article on robotics in this issue (you have,



haven't you?) — with this fascinating program you can flex your own robotic muscles on your Amiga's screen.

66 FPIC

Doctor your boring picture files and forget the wife's tears. FPIC allows you to enhance your Amiga art using the excellent image processing tools offered within the depths of it's menus.



68 DROP'SHADOW

3D displays are all very nice but with this program your Amiga can master the third dimension. Dropshadow automatically adds very convincing shadows to all WorldArch windows.

69 CHEATS!!!

Now Amiga owners can be as dishonest as their ST brethren with patch programs for StarGliders, Amiga Runes and Source Ranger. Refreshing the levels other players can't reach!

**WE'RE PAYING
£800!
FOR GOOD
SOFTWARE ON
OUR COVER DISK**

We're looking for good quality software to fill our cover disk each month. If you're a self-programmer you could earn big bucks from your software — games, business applications, utilities, or anything of general interest. We're also interested in any especially original graphics you may have created with art packages. Write for instructions on the disk or printing in the magazine.

Turn to the end of this section for more details on how to get your software onto the Format cover disk.



■ Michael Perotti,
author of
Powerdrome

POWERDROME DEMO Colour 5th only FILE NAME: POWERDROM.IMG

Suddenly you're in the hot seat of a pilot in the Powerdrome 300V championships, up against fast top pilots from other galaxies. Your mission, should you choose to accept it, is to scorch around the course faster than any other being, and capture the coveted Optimum Trophy.

Powerdrome is the hottest new game for the CD from Electronic Arts, and their first product written solely in the UK (do we hear cheers of Rule Britannia in the background?). It's due for release in late September, with an Amiga version in November. The final program will have a unique two-player option, allowing you to hook up two machines together and blast a friend from the skies. In the full game, you've got a nucleus of six stars to negotiate on different planets around the galaxy. The precise timing is the key to success: a timing-up screen shows you to track the satellites, asteroids, fuel choice and engine to perfection.

You can pop in to the Robosuits for repairs – the pits are fully automatic, but if you're too badly dam-



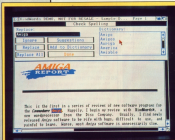
■ Hurting round a corner faster than you might in Powerdrome... the 3D walls help and turn impressively fast – listen and you could be a case for the scrap squad.

aged you may have to call the intergalactic AA for a tow home (No, you're a nice android, a very, very nice android, etc.)

It's the 3D action graphics and slick, snappy sounds that power Powerdrome to the front of racing sims. But don't take our word for it,

sit back and let the action speak for itself. To spare your nerves unnecessarily flaying, the demo doesn't ask you to do anything – it shows off its muscles while you sit and gape.

Electronic Arts tell us that the music on the final game will be very improved over this demo version.



KIND WORDS DEMO
All Amigas
ICON NAMES:
KINDWORDS, KINDWORDS.SOC
This is a demo of the upcoming Kind Words word processor from the Disc Company/IBM Marketing.

Kind Words includes everything you'd expect to see in an Amiga word processor, and many extras. The full version of Kind Words incorporates a 50,000 word spell checker and mail merge facilities as well as the ability to import pictures into your documents.

If you've ever used an Amiga word processor that allowed you to include graphics with

your text, you'll know that although it looks lovely on screen, once printed out the results can look decidedly grubby. In response to this, Kind Words uses high resolution 'Super Font' that have four times as many dots per character as the standard Amiga system fonts. Another powerful feature of Kind Words is graphics manipulation – since you've loaded a picture into your document, it can be stretched or cropped to size.

The version on this month's cover disk is complete except for mail merge and spell checking. It also doesn't support saving or printing documents. If they lack these features is, there'd be no reason to buy the full version, would there? What you can do in Kind Words is FF graphics and manipulate them within the program. You'll soon see what a joy Kind Words is to use. You'll also notice that some of the fonts are missing – a function of available space on this month's disk!

As Kind Words uses disk based fonts, our demo will only load when the disk is inserted at the 'Insert Wordbank' screen. If you've already got Wordbank on another program running on your Amiga, press [Ctrl+Alt+Amiga] and insert the Cover Disk into your Amiga's internal drive. The Kind Words demo then loads automatically. As a final note, during the loading of fonts/keys the screen will act very strangely indeed, don't worry about this as it's only not very clever decompacting program doing its stuff.

■ Contact IBM Marketing at Brooklyn House, 33 The Green, West Nyack, N.Y. If you want to purchase the full version, at a mere \$19.95.

ST

First, copy and load the disk as described at the end of the Disk Extra section.

CHESSNUT

by G. Franklin

Colour STs

FILENAME: CHESSNUT.PRG

CHESSNUT.DOC

Just about every disk contained Megamania for those of you who enjoy a good blast. This issue it's time to bring a bit of nonviolent gaming to the cover disk in the form of the excellent 3D chess program, Chessnut.

Chessnut can be run by either double-clicking on the Chessnut icon on the Desktop or by selecting the Chessnut option from the menu program, **CLICK_ME**. A detailed documentation file called **CHESSNUT.DOC** is also included on the disk. You need



■ Chessnut setting out to play a mean game

to read this before you can play the game properly.

The most impressive thing about Chessnut is the excellent 3D graphics - definitely on a par with commercially available chess programs such as ChessMaster 2000 from Electronic Arts. If 3D doesn't appeal to you, you can easily switch to a 2 dimensional view with the click of a mouse button.

The first thing you do to play Chessnut is to select which colour you want to play by pressing either a or n. You then select a computer or human opponent from the Game menu. All moves are entered in algebraic notations such as e2-e3 - this particular move would take a piece from position E1, two squares forward to E3.

SPRITE EDITOR

by Stephen Kendrick

All STs

FILENAME: DESIGNER.PRG, DESIGNER.DOC

Calling all GFA Basic programmers! As many of you will know, designing and incorporating multi-coloured sprites into GFA Basic can be a rather long-winded process to say the least. Well at last help is at hand in the form of Stephen Kendrick's incredibly useful GFA Sprite Designer.

Until now there have been several ways of designing and using sprites, though all require a fair amount of luck and perseverance. You could either load a picture file into your program, cut out the area of the screen you wish to use as a sprite and save it to disk. Alternatively, you could use GFA's own sprite editor, but that only runs in high resolution. Multi-colour sprites are still a problem.

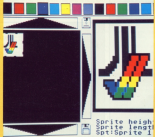
Loading and running the sprite designer is simplicity itself. The first and easiest method is to click on the **CLICK_ME** menu program from the cover disk. Alternatively, you can double-click directly on the **DESIGNER.PRPG** icon.

Also on the disk is a file called **DESIGNER.DOC**, which is the author's own instruction manual for the program. Although the program is pretty self-explanatory, this file is recommended reading for any who wish to use the program to its full.

As with many programs, the best way of learning Designer is to play around with it, but here's a quick run down of what it has to offer. When you first load the designer program you notice 16 boxes representing the current colour palette. Obviously in medium or high resolution modes only some of these will show colours. Below the colour palette are two boxes, the left-hand one showing the entire work area of 128 by 128 pixels, with the right-hand one giving a magnified view of a small section of the work area. All pixel editing is done within this box and your sprite is automatically drawn to actual size in

the left-hand box.

Branching off from the main screen are several menu screens that allow you to do such wondrous things as defining a custom colour palette with the full 512 colours in the ST's repertoire. Another screen lets you set a mask for a sprite (a mask is like a transparent border which stops the sprite from interfering with the background screen, or vice versa).



COMPUTER GAMES

If you thought Space Invaders was the oldest computer game, think again. The basic methods for playing chess by computer were described by Claude Shannon in 1949, and the first programs ran on IBM mainframes in the 1960s. In 1977, a computer programmed for Northwestern University in Canada became the first to beat a Grandmaster in a competition. Even so, top players still seldom compete and are incapable of matching the Karpis and Kasparov of the world. Over 4 30 years, and still we...

DC CLOCK Public Domain All STs FILENAME: DCCLOCK. PRG, DCCLOCK.DOC

Remember the fast formatter we included on cover disk 17 DC CLOCK is another game CD from the same authors and once again proves invaluable. Now you can even leave working away on your ST only to find that what seemed to be ten minutes (key-board tapping) was, in fact, much longer! DC CLOCK puts a digital clock in the top right-hand corner of the screen so needn't even take your eyes off your monitor to be able to keep track of the time.

Install DC CLOCK either by clicking on its program icon from the Desktop or by selecting it from the CLICK-ME menu. When it has finished loading it prompts you to enter the current date and time. Do this and click on OK. As if by magic (and clever programming), a clock appears on the screen happily ticking away. The clever thing about DC CLOCK is that it is independent of the screen, so it always appears in front of anything else on it. Since it works using interrupts, however, some programs may slow it down or even stop it all together.

If for any reason you'd rather not be worried at the steady advance of time, run DC CLOCK a second time to remove it.

CHEATS by D. Sanger All Colour STs FOLDER: POKES

Once again we bring you some of the best ST game cheats. You'll find Cheats for Melbourne House's Xenon

and Bomble's arcade conversion Star Wars. If you're fed up with getting blown up, shot or eaten, simply follow the instructions in the above mentioned files. Each documentation file has the same name as the game, but a .DOC suffix to load and edit. Make sure you also read our facility provided disclaimer and never use the original copy of a game to try a poke out on. See "Gamebooks" on pages 74/75 for more details.



AMIGA

First, copy and load the disk as described at the end of the Disk Extra section. These programs run on both the Amiga 500 and the 2000. We have been unable to test them on the early versions of the Amiga 1000.

3D ARM Public Domain All Amigas ICON NAMES: ARM, ARM.DOC

On your way to these pages, you may have noticed a robotic figure featuring strongly within this month's format. Like it or not, the use of

robots in all areas of life is becoming increasingly obvious. We thought you might like to experiment with the theory behind robotic control and have included 3D ARM to help you do just that.

In the words of its authors, 3D ARM was designed to study "goal-directed animation of articulated objects". For those of you who didn't understand a word of that, articulated objects are those that have got joints like wrists and elbows, but are constrained by attachment to other objects, like the hand, forearm and upper arm of a robot, for instance. If that last sentence sounded tricky too, it's because it was again stolen from the author's documentation!

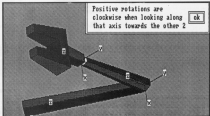
You can load 3D ARM by double-clicking on its Workbench icon or by selecting it from the CLICK-ME menu program. Also included with the program is a short documentation file describing fully all the functions of the program. Once loaded, a wire frame 3D view of a robot arm is displayed. The arm itself is split into three parts with fully articulated joints at the wrist, elbow and shoulder. All three joints can be assigned movements independently or, for more realistic action, can be made to move all three.

NEXT MONTH

Remember all players of Melbourne House's "Xenon Master". On next month's disk will be a cheating program from reader Edward Penner to completely outwit your own fair game. You can write a new map and change any of the characters or locations - in short, it gives you a whole new game!

Positive rotations are clockwise when looking along that axis towards the other 2

ok



■ Not quite XENON, but nevertheless a real robot arm on your Amiga, courtesy of the 3D ARM program.



■ **FPIC** can enhance your **Google Analytics** blog -- here's a sample for what the actual code.

With the arrival of machines such as the 31 and Amiga, graphics requirements that were once the domain of dedicated graphics workstations are now within the grasp of the home user. 'Digital Image Processing' is one graphic technique now available to Amiga owners. There is no denying that the Amiga is starting to make an impact in the video industry, and with this success have followed several well-known quality image reproduction



■ **Integration with Windows:** Single-click integration with Windows.

CHEATS:
by A. Gills
All Arrogas
ICON NAMES: P
PATCH: 41, 100

Of course, the *Grand Rally* is a nice quick way of getting the better of three of the Amiga's top games! Quick says round Mantis, *StreetRacer*, *Football's*, *Amiga Rally* and Mantissoft's excellent *Space Invader*.

The patch program does not work from our disk menu so you have to double-click on its icon instead. You'll find Patch_#1 in the GameLibrary drawer in the root directory of the laser disk. It's very straightforward to use, but if you do not think you'll find a documentation



He is the same director in the program, but with the usual DOE extension. You'll also find further info in the "Generalists" list on page 14.08.

FORMAT WARNING! This program directly modifies the games on disk, so only use it on a BACKUP. If you can't copy a particular game disk, don't use the patch on your original disk unless you want to have the cheat on it for good! We've been unable to test these patches so you use them at your own risk. **ST Nintendo Format** cannot be held responsible.

packages. Packages such as *Sketcher* and *FORMde* are excellent examples of the high quality of things programs of this genre. Not to be left out, *Formal presents*. *FFC*, a public domain image processing package.

You can load FPE either from our **CLICK ME** menu or by directly clicking on the FPE icon. Either way, to the FPE icon, is **FPE.DOC**, a file containing the author's documentation. Read this first for full instructions.

Once loaded, IFC displays a blank screen. The first thing you should do is to load a picture - any low-resolution Amiga picture file should do (such as last month's *Donna* picture). All popular Amiga art packages support the WF format (Paint, Apple Images etc). If you want the power of an Amiga art package, the *True* public domain ones are a good source of FF art work from some of the Amiga's top creative artists.

All functions within FPC are accessed from the pull down menu. It's worth experimenting with all the different processing tools to get an idea of what's on offer. A word of warning though: as FPC was designed primarily for use on video images, some of the tools can cause strange results if you're not careful. I saw one completely batch up your

work of art, all is not lost as you can restore your picture to its former glory by selecting Restore Image from the Photo menu.

DROPSHADOW
Public Domain
All Amigas
ICON NAMES: DROPSHAD-
ow, DROPSHADOW.DOC

How many times have you been working with the Wordbench and chafed at the screen with lots of windows. As you probably know, all these windows, overlapping each other can get a little confusing. Jorgelinux helps you get over this problem by attaching windows to every window. Not only is this very useful, but it looks a lot better than the standard windows desktop.

For those into the technical side of the Amiga, DropShadow works by adding an extra bit plane to the write-behind screen that is completely transparent to all other programs. This doubles the number of colors used by the Workbench to eight, the extra four being used as darker copies of the first four.

Once loaded, ShadowShade opens a window containing two slider controls. One controls the depth of the shadows and the other, the distance



1. Make sure that the master ST-506 Format disk is write protected and put it in the disk drive. Double-click on the disk icon that appears. Drag any icons you are in the contents window onto the CDD disk icon.

You will now be asked whether you want to run the program or not. As an alternative to using `CLICK_ME.PRG`, if you know enough about DOS you can click directly on the icons for individual programs. These normally end in `.PRG` with the documentation files having the same name as the program to which they refer, but with a `.DOC` suffix. Always read the documentation before running the program.

The **READ_ME** text gives you a brief summary of the disk's contents and how to use it.

Many of the programs on IT Assign Format disks are Public Domain. In such cases we're simply passing on their standard documentation files unchanged, as is customary in the FO code of practice. Some of the programs are "idiosyncratic"; shall we say, as pleasant don't blame us for any misadventure.

ST MEGARIT MINIROD

Make copies of this file and load it into Myapoint before you start work on your picture. When you come to save the graphic, give it a different name and you will then be able to reload the file conveniently at a later date. Full instructions are included as a help file on this month's disk. Have fun with the programme... we tested it with Emma Liss, and so must recommend it.

WE WANT TO GIVE YOU MONEY!

4. If you want to do this with a new car, be aware the right to recall voids the heavy metal in the small letters in its compensation things to your pet available. Carefully, always we've already given you minor minor programs for life's best, please do about your dog's care carefully.



Downloaded from <http://ajphaphysocpharm.sagepub.com/> at 11:06 11 November 2014

[illegible]

THE ULTIMATE ROCK PRODUCTION PROCESS

- [illegible]



PROFESSOR *Yes, but I don't know what to do about it.*



Figure 2

© 2000 by John Wiley & Sons, Inc. All rights reserved. This journal is registered at the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923. Organizations in the U.S. who are also registered with C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of U.S. copyright law) subject to payment to C.C.C. of the per copy fee of \$05.00. This consent does not extend to multiple copying for promotional or commercial purposes. ISI Tear Sheet Service, 3501 Market Street, Philadelphia, PA 19104, USA, is authorized to supply single copies of separate articles for private use only. Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions. For all other use, permission should be sought from John Wiley & Sons, Inc. or the appropriate copyright owner. This journal is also registered at the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923. Organizations in the U.S. who are also registered with C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of U.S. copyright law) subject to payment to C.C.C. of the per copy fee of \$05.00. This consent does not extend to multiple copying for promotional or commercial purposes. ISI Tear Sheet Service, 3501 Market Street, Philadelphia, PA 19104, USA, is authorized to supply single copies of separate articles for private use only. Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions. For all other use, permission should be sought from John Wiley & Sons, Inc. or the appropriate copyright owner.



FOURTH WAVE

[illegible]

AVAILABLE FROM	DESCRIPTION	PRICE	ORDER NO.
AS ORDERED BY YOU	100% COTTON T-SHIRT	\$14.95	100-100-100

[illegible][illegible]

Journal of Management Education 35(1)

[illegible]

THE UNIVERSITY OF CHICAGO

IMPACT ANIMATION

LOWEST ENTER PRICE SOFTWARE

We can offer an unrivalled service to you -

TITLE	OUR PRICE	R.R.P
Defender of the Crown	£18.95	£29.95
Goldrunner	£17.95	£24.95
King of Chicago	£19.00	£29.99
Flight Simulator II	£21.45	£44.95
Sidewinder	£9.30	£9.99
Opeliterator	£17.90	£24.95
Headwreck	£14.95	£19.99

De-Lux Paint II (PAL)	£39.95	£39.95
Orig Paint	£39.95	£39.95
De-Lux Music	£39.95	£39.95
De-Lux video (PAL)	£39.95	£39.95
Sculpt 3D	£52.00	£55.00
Animate 3D	£69.00	£129.00

Please ring for details of Hardware Prices
Please enclose 30p. P&P with each item.

IMPACT ANIMATION, WATERLOO BUILDING,
SUNDERLAND PARK, ST. HAYWOOD
ST1 2EA. TEL: 0904 741 741.

BYTEBACK Copy OTHER & MOUNTY CLONE
MATERIAL. NOT TO BE REPRODUCED



PUBLIC KNOWLEDGE

The ST has a growing corpus of Public Domain programs from Britain, the States and Europe. Picking the best bits can save pounds, as Elliott Stein discovers when he ventures into the libraries.

A ten ST Public Domain software is a potpourri of programs, varying quite dramatically in quality.

Some PD software was actually sold commercially once. Typing Tutor, an excellent educational package from Academy Software, is very effective at teaching and reinforcing touch typing skills. This is supplied with another program, called Word Reader, a game to test your touch-typing skills.

Other PD titles are the beginnings of commercial products. Jet Word, a GEM-based word processor at some time bundled with early STs, later evolved into the best selling Jet Word Plus. Though Jet Word has been overtaken by more powerful (and expensive) WPs, there was a time when it was one of the best available for the ST and widely used.

ST Public Domain is really at a point where it warrants a serious look — and where else to begin a serious look than the group of titles which may be the most useful of PD software: Utilities and Disk Accessories.

Utilities and disk accessories

Hard discs, print spooler and DA, our custom appear to be the first stop-off for ST Programmers, and there is a curious co-incidence of them in the Public Domain.

The best IBM disk out of the buyers is Intersect by Randy Myers, an ingenious program which cleverly sits in the disk accessory window and can therefore be turned on or off or moved at any time during a session. It is far more versatile than most of the others which have a fixed size and can only be removed when the computer is switched off or reset.

DC Format by Paul Lee and Keith Series is probably the best of all disk formatting and copying programs, but only will it format a disk in an extended format, yielding more space, but, through its attractive user-friendly shell, it even formats and copies disks in PC or MagicDisk formats (Magic-

Disk is a Mac emulator for the ST).

More limited by Mike Ward (as provided on Format's issue 2 cover disk) can save users of colour monitors the price of a higher-monochromed one, as it persuades monochrome programs to run on a colour monitor. Though not as good as the real thing, it's certainly better than not being able to use more programs at all.

There are several multifunction DA programs, like the well-designed System by Paul Carleton, which features Printer configuration, RISC setup, colour palette, notepad, mouse and keyboard speed, clock and date set, disk formatter and even a command shell.

In business

Unlike PD for PC compatibles and the Macintosh, the ST has yet to establish a wide selection of quality word processors, databases and financial programs. The best of PD word processors on the ST include Jet Word and ST Writer Lite, an updated and altered version of a non-GEM WP, originally bundled with early STs. Since the original ST Writer's release, programmer Bruce D. Roemer has added a GEM interface to it and cleaned up some of its early bugs. ST Writer is also available in French, Spanish and German versions.

There is one PD Database of commercial quality — DB Master 1, a program also originally bundled with early STs. It is a fully GEM-driven program in two shells, MANDONE and USCDONE, and features many of the facilities you'd expect from a good database, as well as some you wouldn't. Because of its consistent scaling, its ability to handle large amounts of text and print out in ASCII, it is a perfect tool for authors who wish to outline and break down a novel or script.

Graphics

How few is an area where PD certainly holds its own. There are several

programs which rival commercial titles like Degas and Art Director. Penultimate is a library only program which was originally funded free with the ST. The latest version 1.0 offers

DEMOS

I can face it — some commercial titles are pretty expensive. Unfortunately, you must often by a title before discovering its worth — and in order to discover its worth you must see it — **DEMO BUST**.

Not always so.

A large number of companies place demo copies of their products into public domain. These are often copies of the actual program with a few of its features disabled (often the "Save File" option). This allows you to have actual experience with WIP: Professional, Jason Martin's Tempus, Transbase, Ed Tracks, Bill Watt, Superbase, Transfile, Graphic Artist, Campus GEM and many other commercial titles, all of which offer demo versions.

Many games also do this, such as Time Bandit, Flight Simulator II, Shanghai, Dark II, Medal and Star Wars, all of which offer limited game play to help you get the feel of them before you fork out your hard-earned money.

Perhaps the best demos come from graphic packages which merely display slides (or text) created from the actual program. The best of this type must be DSD 3-D D.O. Cyberstone, Wild Rover and Magic Animator, featuring stunning shots of various moving images.



■ Fast Formatters abound in PD — DCFORMAT allows you to update more space onto your disks by putting more tracks per side and more sectors per track.



ODDITIES

What do you call a program which reads an ASCII file using a software voice synthesizer? Program or Delusional Marks called it. It reads and played it in an eight-frame GEM frame work.

One May is a color-plate map of the solar system which allows you to zoom in on planets, obtain information about them and scan the stars. For musicians, there are PD programs from Gedaliah Gershwin keyboards to record and edit, to 32-track MIDI sequencers.

many new features, including shape generators, patterns, rotation and flip. There is even the mysterious animation facility which can only be obtained by first selecting 'The Quicker' icon and using the right mouse button to click the pointer in the loop of the second 'W' in the word 'Quicker'. When this is performed, an icon of a Film Camera appears in the icon selection window.

Master Palette is a colour program which lets you mix up to 512 colours on the screen at the same time just like Spectrum 512 and Quantum Paint. Though its features are limited, it's perfect for altering the limited colours of works originally created on Digas or Macintosh. There is also a wealth of graphics utilities which support and enhance well-known graphics packages, as well as programs which convert files from one graphics program to those of another.

3d (Real Image Master) by Franz Grosse from The Applied Physics Department of Delft University of Technology isn't a drawing program but a technically advanced image manipulation processor of industrial quality. Running under GEM and featuring multiple windows and importation of Digas and Macintosh pictures, it is a must for any graphic artist interested in getting the most out of his/her art. **REMARKS:** This is a very complex program and its use is made more difficult by its highly technical documentation.



■ The Realtime animation feature of Realtime



■ The Deluxe game with a all-purpose disk accessory, COMPROM, running over it.

LIBRARIES

Luckily for PD enthusiasts there exist several libraries which specialise in collecting the best PD and shareware software from around the world.

For a reasonably full list of the sites mentioned in the article and readily available Mac libraries which have proven reliable and which constantly cover for the best in ST PD software are: **PI/PPI/PDIP-SE, 3D Street** (Camden, Northlake, Aberdeen MS2 33N 00334) 081604 **PA&S 4, PD Star Ltd**, Bedford 0710 106 0585/01 0586

SOFTVILLE, 88 Brighton Avenue, Weymouth, Devon PL2 7PY (0309) 344509
THE GEMMY BEST SOFTWARE LIBRARY, 5 Barn Gate Way, Bude Gwent, South Wales SA71 1 687
STAN 88, 50 Denham Drive, Weymouth, Dorset BH1 2JN (0305) 882024

There's no recognised cataloguing system for ST PD, so there is with the Amiga File One. You'll need to contact a supplier and request the programs you're after by name. Please tell them where you heard of their services.

To complement the wide variety of art packages there is a good supply of sample pictures in Digas and Macintosh formats, as well as plenty of digitised images.

Games

One of the most popular areas of ST PD. The more's advanced features make it an attractive challenge to any games programmer. There are mainly ST versions of traditional games: Backgammon and other card games, Connect 4, Backgammon, 101000, Othello, Tic-Tac-Toe, as well as a real-time simulation of the popular board favourite Monopoly.

Grand is an excellent chess program from Germany, featuring attractive board icons, mouse operation, GEM moves and varying levels of difficulty. Though the documentation is in German, the program is easy to use and compares well with commercially produced computer chess games.

Leadschess is a two player variant of chess, featuring chess pieces armed with lasers and others with mines to deflect the beams. There are also ST versions of popular old computer-vidéo games: Megamania - a superior version of Asteroids (as written in the last Format Cover date), Pacman: the best version of the pursuit video game yet, Diamond Dagger - a Rodentash clone with 25 levels, dozens of Breakout type games and traditional space shoot-em-ups such as Asterix, Demoset and Orion's Fire.

As well as the games, there are utilities for commercial games, such as the Advanced Construction Set which lets you design new Arkonoid worlds. There are also special 'cheat' utilities for popular titles like Cluedo, Barbarian and Time Travel.

Another fine selection of PD games are the infocom-style text adventures like Monty Python and the Holy Grail and Once a Ring. For those who don't want to play other people's text adventures there is The Adventure Writer system by David Bell, a complete programming language to design text adventures of

your own.

Many of the PD games are of excellent quality and would probably be sold commercially on 8 bit computers. Though many PD titles like Babel, Stone Age and Freedom are challenging and well thought-out games of skill, they haven't the dazzling graphics and innovation play of the more popular commercial ST games.

Languages and games

You can find a PD version of most computer languages: BASIC, Logo, Lisp, C, Fortran, Pascal and others. Many with helpful documentation on disk. There are also assemblers and disassemblers, and editors for programmers and other utilities, such as a one to convert GEM BASIC to ST BASIC or Fast BASIC and vice-versa. In addition to the languages themselves, there are hundreds of sample source programs. For modems users there are full featured communications programs like Telnet, which contain most of the features of commercial programs. FST104 simulates Peridot graphics and BSC is a VT100 Terminal Emulator for Compuserve 8 - protocol. In addition to the more terminal simulators, there are versions of format utilities for compressing and decompressing files and down full featured RMS programs like Starman RMS for those considering their own bulletin boards. In short, there's everything you'll need in PD for communications except the modem itself.

Others

There are also animation programs, children's games, label makers, 3D construction kits, hard disk utilities, magazines on disk, ham radio utilities, storylines, multitasking, digitised music, thesauri, desktop fonts and many others. The best way to find out is to search exactly what is available in its used for the categories offered by the PD suppliers.



Timesoft



Timesoft



Timesoft



Timesoft



Timesoft



Timesoft

ATARI ST SOFTWARE**ARCADE**

Glenn Softers	14.95
Space Harriers	15.95
Empire Strikes Back	14.95
Football Manager	14.95
Alien Syndrome	14.95
Fire & Forget	12.95
Oberlander	14.95
Blown Commands	14.95
Eddie Edwards 94	14.95
Peter Beardsley Soccer	14.95
Impossible Mission II	12.95
Dungeon Master	19.95
Wizard Wars	14.95
Thundercats	14.95
Rugby Boy	13.95
Side Arms	14.95
Ice Palace	13.95

ADVENTURES

Legend of Boreas	14.95
Sundog	14.95
Captain Steel	19.95
Nightmare	14.95
Star	22.95

3112 DESKS

X 10	14.95
X 20	227.95
X 30	599.00

JM

AMIGA SOFTWARE & HARDWARE**ARCADE**

Fire & Forget	14.95
Sentinel	14.95
Football Manager II	14.95
Rugby Boy	13.95
Thundercats	13.95
AAPQYI	14.95
Better Dead Than Alien	18.95
Black Lamp	14.95
Three Stooges	24.95
Kanon	14.95
P. Beardsley	14.95
Bubble Bobble	14.95
Wiz Ball	19.95
Viper	12.00

DTP AMIGA

CITY DISK	£75.00
VIZWRITE	£75.00
PAGE SETTER	£69.00

**MOUSE MATS
£4.95****WIDE RANGE OF
JOYSTICKS
AVAILABLE****'T' SHIRTS****£5.50**
INC P & PPLEASE STATE DESIGN
AND SIZE REQUIRED
M, L & XL**AMIGA A500 PACKS****PACK 1**
A500 Computer
Hacker II
Music Studio
Basic Manuals
£335.00 + VAT**PACK 2**
A500 Computer
1084 Col. Monitor
& Software
£549.00 + VAT**PACK 3**
A500 Computer
1084 Col. Monitor
Dot Matrix Printer
"Works" Software
£679.00 + VAT

• Postage & Packaging FREE in UK Europe - overseas £2.00

TIMESOFT35 London Road, Tooting, London, SW17 9JR
Telephone: 01 685 98 9859 Enq. & Orders

NEW NEW NEW



GAME BUSTERS

When the play's so frustratin, ya feel ya gonna burst; when your teeth start gratin and ya desperately need a first, where ya gonna go? Gamebusters! More thrills and exposes than Lady Godiver's trot down Coventry High street.



STARBLAZER ■ Amiga

For invisibility, launch your ship, press (F3A) for fixed cross hair, slow down to zero velocity and press (Backspace) to pause the game. Type JS AND S. Pause the game again and type JS AND S. You can tell if the cheat is active as all the instruments will go to the centre position. You can now fly around and blow things up without worry.

Press (M) if you want to be really lazy. This turns the aliens allowing you to give them hell. Another stab at (M) will restart the beings from outer space.

Missiles are topped up by pressing (P), an object editor is reached by pressing (X) (which allows you to spin and zoom in on any of the vector graphics).

Janis Kamea
Purtonmouth, Hants

LEATHERNECK

■ ST

Type in DUTHERNECK then press (F), all your men will have protective shields. Nothing can harm you now except your buddy's bullets in your back.

C Warren
Purtonmouth, Norfolk



SAPHERS ■ ST

Starting Out - when creating your character it is best to pick out a lot of charms. This should make it easier to find a companion (you'll need one to complete it). Once you're used to the add controls, talk to the chief using the 'What do you want?' option. He will tell you of your first quest.

Food and Water - food can be obtained by killing rabbits, snakes, chickens and bears. Water (also fairly valuable) can be obtained by walking along rivers. Water holes are marked above the landscape. There is one towards the southern edge

of your village. As soon as you use 'the pulling of a spring', press the right mouse button. Use the 'Talk' option.

Trading and Conversation - be nice to other members of your tribe. You'll need items from them, such as water skins, flint knives, food and other weapons. Always tell them your name and end the conversation with 'Good Hunting'.

Combat - stand down and let your attackers come towards you. When they get close, hit 'em. Remember you can change weapons by pressing the right hand button. It's a good idea to carry a hatchet and several



SINBAD AND THE THRONE OF THE FALCON

■ Amiga

When earthquakes or storms appear, double click on the quit box in the left corner of the screen. Double click on the Resume Game option from the Game Options menu when it appears. You will find that the earthquakes or storms has disappeared.

Paul Wilson
Reading, Berks

HOLLYWOOD POKER

■ Amiga

Load the game as usual, when the draw light goes out press (Ctrl)AmigaAmiga to reset. When the game loads for the second time you will find the two girls in the first round are very easy to beat.

Joan Fox
Birmingham, Cleveland

INTERCEPTOR

■ Amiga

Load the game normally until asked for LOG DATA. Remove the original disk and make sure it is write enabled. Replace original disk and press return. From now on you have access to all missions.

Angus Northcott
Edinburgh, Scotland



arrows.

Movement - always use the 'Landscape View' for travelling and the 'Lateral View' for reading messages. For the first you must hit as many wild animals as possible and take the meat back to the chief. Quest two has you travelling to the Eagle Eyes tribe and rescuing a rabbitman for a magic potion. In quest three you must reclaim a stolen axe from the Stone Arms tribe. Finally for

quest four you must recapture the Holy Book from the Gray Hymns. Take the Book back to your chief, but make sure you have 12 or so arrows. And that's it.

Tribe Locations - while playing of snake uses both the 'Landscape View' mark tribe locations. They appear grey on the map. Eagle Eyes are situated north-west of your tribe. Gray Hymns involve a long journey north-west of your tribe. Stone Arms are south of the Gray Hymns.

Girk Rushbottom
Runcorn, Cheshire

CARRIER COMMAND

■ ST

When the game is passed type **ORON DUS ALONG WITH ME** to include the tapes. This will put you in a cheat mode. Pressing (+) on the numeric keypad will make your Marlin and Minus move to involve and collisions. The minus key (-) deactivates the **Luxon Oppler** (London SW).



FLIGHT SIMULATOR II

■ Amiga

Landing the plane in a short space is the mission, on **Fluorin** Proceed to land as normal. Just before touching down, keep your fingers pressed on the brakes

FANTASTIC GAMES UP FOR GRABS

Tips, cheats and game-trading plays. Yes, we read the lot. If you've discovered a secret password, written a poem, mapped a game, composed an advertisement, thought ways of getting high scores or know of any other hand-out that lets you win, send us details. By doing so you could win a collection of the best new games for your machine, ST or Amiga.

Interested? Well stop gawping. Get your game features to us. Send them, with your full name, to: **Gamebusters**, 37, Kings Avenue, 4 Queen Street, Bath, BA1 3LJ. Please state whether tips are for ST or Amiga. Try and make tips short and snappy - we want to leave time to complete the game, not a tome on those training armadillos (I have the three-volume edition of *Chetivius* 1994 ready). The *Dry Armadillo* already - (S) for you keep saying - Other (S). Please can be any length as they will be included on the cover disk rather than printed. If a poem is very long please send it on a 3.5" disk, and include a zip bag and return postage if you want it back.

We have had so much good stuff that we've had to hold a lot of it back. Don't worry, it will appear eventually. Keep sending in those creations.



key (I). The plane should virtually stop dead when the wheels touch the ground.

Overhauling - to prevent yourself landing in the drink, select the time on the dashboard and after it is fully running somewhere around 1.5km. The

plane will roll off the runway and into the sea without crashing. This gives you another chance to taxi onto the runway.

Curious co-ordinates - San Francisco area: N11 1429 044, E 5004 8619, A11 0000 (Newark, Newark and Australia).

Changing plane colour - select the multi-player option from the file header and change the colour in the box by clicking on the appropriate box icon.

Getting fuel - fuel can begin to leak forcing you to land during a *Reaction* game. If you are close to a depot, but do not have enough fuel to taxi to other words you have come to a complete standstill try the following: very quickly tap the up/down gear toggle (all key). The nose should drop as the wheels are lifted off the ground, and then lift once the wheels drop. The plane will start to move. Continue doing this until you reach the depot.

Shane Parke
Llanelli Hill, Gwent

ARKANOID ■ Amiga

Focus the game and type **POWERO**. A cylinder will roll down, catch it and type (I) for **Power**, (C) for **Play** and so on. Pressing (P) takes you directly to the final screen.

Janis Rennie
Portsmouth, Hants



CHEATS ON DISK

Have we got some exciting cheats for you this month? Not only for the ST, but for the Amiga as well. Surely a first for the Amiga owners. **Fluorin** Proceed to land as normal. Just before touching down, keep your fingers pressed on the brakes

(Amiga) - Cheats for Star Wars (cheats stored), Amiga (cheats info) and Space Invaders (cheats stored). Reset the computer or wait until your Workbench disk. Replace this disk with the cover disk. Click the **COMPACT** icon and then the **COMPACT** icon. When it appears, double-click on the **COMPACT** icon. Follow the instructions from there. Make sure you do not lose the instructions - as we pointed out earlier, we can't be held responsible for your actions. The Amiga cheats write to disk, so make a backup of your original disks before using them.

ST - Down (immediately and start on any level options) and Star Wars (cheats stored) this month. Reset your machine and place the cover disk in the drive. Double-click on the **COMPACT** icon when the desktop comes to view. Two new options, **COMPACT** and **COMPACT**, will be displayed. Click on the required one and then click on the **COMPACT** icon. Follow the instructions from there. Make sure you do not lose the instructions - as we pointed out earlier, we can't be held responsible for your actions. The Amiga cheats write to disk, so make a backup of your original disks before using them.



THIS MONTH'S WINNERS

It's a long list for the great game-trading plays for Star Wars and Amiga. We will have of **Weekly ST** often released in this issue.

Shane Parke for taking the cheat out of **Fluorin** simulator II. All the Amiga cheats will be flying in the air.

STAR QUAKE ■ ST

Import games: 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 2682, 2683, 2684, 2685, 2686, 2687, 2688, 2689, 2690, 2691, 2692, 2693, 2694, 2695, 2696, 2697, 2698, 2699, 2700, 2701, 2702, 2703, 2704, 2705, 2706, 2707, 2708, 2709, 2710, 2711, 2712, 2713, 2714, 2715, 2716, 2717, 2718, 2719, 2720, 2721, 2722, 2723, 2724, 2725, 2726, 2727, 2728, 2729, 2730, 2731, 2732, 2733, 2734, 2735, 2736, 2737, 2738, 2739, 2740, 2741, 2742, 2743, 2744, 2745, 2746, 2747, 2748, 2749, 2750, 2751, 2752, 2753, 2754, 2755, 2756, 2757, 2758, 2759, 2760, 2761, 2762, 2763, 2764, 2765, 2766, 2767, 2768, 2769, 2770, 2771, 2772, 2773, 2774, 2775, 2776, 2777, 2778, 2779, 2780, 2781, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2789, 2790, 2791, 2792, 2793, 2794, 2795, 2796, 2797, 2798, 2799, 2800, 2801, 2802, 2803, 2804, 2805, 2806, 2807, 2808, 2809, 2810, 2811, 2812, 2813, 2814, 2815, 2816, 2817, 2818, 2819, 2820, 2821, 2822, 2823, 2824, 2825, 2826, 2827, 2828, 2829, 2830, 2831, 2832, 2833, 2834, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843, 2844, 2845, 2846, 2847, 2848, 2849, 2850, 2851, 2852, 2853, 2854, 2855, 2856, 2857, 2858, 2859, 2860, 2861, 2862, 2863, 2864, 2865, 2866, 2867, 2868, 2869, 2870, 2871, 2872, 2873, 2874, 2875, 2876, 2877, 2878, 2879, 2880, 2881, 2882, 2883, 2884, 2885, 2886, 2887, 2888, 2889, 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 2907, 2908, 2909, 2910, 2911, 2912, 2913, 2914, 2915, 2916, 2917, 2918, 2919, 2920, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929, 2930, 2931, 2932, 2933, 2934, 2935, 2936, 2937, 2938, 2939, 2940, 2941, 2942, 2943, 2944, 2945, 2946, 2947, 2948, 2949, 2950, 2951, 2952, 2953, 2954, 2955, 2956, 2957, 2958, 2959, 2960, 2961, 2962, 2963, 2964, 2965, 2966, 2967, 2968, 2969, 2970, 2971, 2972, 2973, 2974, 2975, 2976, 2977, 2978, 2979, 2980, 2981, 2982, 2983, 2984, 2985, 2986, 2987, 2988, 2989, 2990, 2991, 2992, 2993, 2994, 2995, 2996, 2997, 2998, 2999, 3000, 3001, 3002, 3003, 3004, 3005, 3006, 3007, 3008, 3009, 3010, 3011, 3012, 3013, 3014, 3015, 3016, 3017, 3018, 3019, 3020, 3021, 3022, 3023, 3024, 3025, 3026, 3027, 3028, 3029, 3030, 3031, 3032, 3033, 3034, 3035, 3036, 3037, 3038, 3039, 3040, 3041, 3042, 3043, 3044, 3045, 3046, 3047, 3048, 3049, 3050, 3051, 3052, 3053, 3054, 3055, 3056, 3057, 3058, 3059, 3060, 3061, 3062, 3063, 3064, 3065, 3066, 3067, 3068, 3069, 3070, 3071, 3072, 3073, 3074, 3075, 3076, 3077, 3078, 3079, 3080, 3081, 3082, 3083, 3084, 3085, 3086, 3087, 3088, 3089, 3090, 3091, 3092, 3093, 3094, 3095, 3096, 3097, 3098, 3099, 3100, 3101, 3102, 3103, 3104, 3105, 3106, 3107, 3108, 3109, 3110, 3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3120, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3133, 3134, 3135, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3143, 3144, 3145, 3146, 3147, 3148, 3149, 3150, 3151, 3152, 3153, 3154, 3155, 3156, 3157, 3158, 3159, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3167, 3168, 3169, 3170, 3171, 3172, 3173, 3174, 3175, 3176, 3177, 3178, 3179, 3180, 3181, 3182, 3183, 3184, 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3193, 3194, 3195, 3196, 3197, 3198, 3199, 3200, 3201, 3202, 3203, 3204, 3205, 3206, 3207, 3208, 3209, 3210, 3211, 3212, 3213, 3214, 3215, 3216, 3217, 3218, 3219, 3220, 3221, 3222, 3223, 3224, 3225, 3226, 3227, 3228, 3229, 3230, 3231, 3232, 3233, 3234, 3235, 3236, 3237, 3238, 3239, 3240, 3241, 3242, 3243, 3244, 3245, 3246, 3247, 3248, 3249, 3250, 3251, 3252, 3253, 3254, 3255, 3256, 3257, 3258, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267, 3268, 3269, 3270, 3271, 3272, 3273, 3274, 3275, 3276, 3277, 3278, 3279, 3280, 3281, 3282, 3283, 3284, 3285, 3286, 3287, 3288, 3289, 3290, 3291, 3292, 3293, 3294, 3295, 3296, 3297, 3298, 3299, 3300, 3301, 3302, 3303, 3304, 3305, 3306, 3307, 3308, 3309, 3310, 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3332, 3333, 3334, 3335, 3336, 3337, 3338, 3339, 3340, 3341, 3342, 3343, 3344, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3353, 3354, 3355, 3356, 3357, 3358, 3359, 3360, 3361, 3362, 3363, 3364, 3365, 3366, 3367, 3368, 3369, 3370, 3371, 3372, 3373, 3374, 3375, 3376, 3377, 3378, 3379, 3380, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389, 3390, 3391, 3392, 3393, 3394, 3395, 3396, 3397, 3398, 3399, 3400, 3401, 3402, 3403, 3404, 3405, 3406, 3407, 3408, 3409, 3410, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3418, 3419, 3420, 3421, 3422, 3423, 3424, 3425, 3426, 3427, 3428, 3429, 3430, 3431, 3432, 3433, 3434, 3435, 3436, 3437, 3438, 3439, 3440, 3441, 3442, 3443, 3444, 3445, 3446, 3447, 3448, 3449, 3450, 3451, 3452, 3453, 3454, 3455, 3456, 3457, 3458, 3459, 3460, 3461, 3462, 3463, 3464, 3465, 3466, 3467, 3468, 3469, 3470, 3471, 3472, 3473, 3474, 3475, 3476, 3477, 3478, 3479, 3480, 3481, 3482, 3483, 3484, 3485, 3486, 3487, 3488, 3489, 3490, 3491, 3492, 3493, 3494, 3495, 3496, 3497, 3498, 3499, 3500, 3501, 3502, 3503, 3504, 3505, 3506, 3507, 3508, 3509, 3510, 3511, 3512, 3513, 3514, 3515, 3516, 3517, 3518, 3519, 3520, 3521, 3522, 3523, 3524, 3525, 3526, 3527, 3528, 3529, 3530, 3531, 3532, 3533, 3534, 3535, 3536, 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556, 3557, 3558, 3559, 3560, 3561, 3562, 3563, 3564, 3565, 3566, 3567, 3568, 3569, 3570, 3571, 3572, 3573, 3574, 3575, 3576, 3577, 3578, 3579, 3580, 3581, 3582, 3583, 3584, 3585, 3586, 3587, 3588, 3589, 3590, 3591, 3592, 3593, 3594, 3595, 3596, 3597, 3598, 3599, 3600, 3601, 3602, 3603, 3604, 3605, 360



PROGRAMMING

LEARN BASIC

Loops and branches this month, and who better to lead the way than our very own BASIC horticulturalist, Richard "Green Thumb" Montano

Not a time for introductory stuff this month; there is much to cover and little space to do it.

When it comes to repetitive tasks or testing for particular occurrences, nothing does it better than a computer. Especially a computer with BASIC in control. Say you wish to print a character 5 times. You could write a program like this:

```
FOR I=1 TO 5
PRINT "A"
NEXT I
```

You can. By using what is known as a FOR...NEXT loop. You could replace the previous four lines with:

```
FOR I=1 TO 5
PRINT "A"
NEXT I
```

The variable following FOR is used as a counter; in this case it will hold in turn the numbers 1 and 5 (as the command says I=1 TO 5). `PRINT` is executed once for each value of I (a 5 times). The `NEXT` command sends the program back to the matching FOR at the start of the loop, where the counter variable is incremented. This sequence repeats until

Of course, the variable doesn't go as `PRINT I=1 TO 5` or `PRINT` are other valid examples. You don't have to count from 1 to 5, either, of course.

```
FOR count=1 TO 5
PRINT "A"
NEXT count
```

```
FOR I=1 TO 214547
PRINT "A"
NEXT I
```

```
FOR count=1 TO 34
PRINT "A"
NEXT count
```

Counting backwards

Almost anything can be included in a FOR...NEXT loop—there is little restriction. Even other FOR...NEXT loops are acceptable:

```
FOR I=1 TO 10
PRINT "Outer Loop"
FOR J=1 TO 10
PRINT "Inner Loop"
NEXT J
NEXT I
```

When one FOR...NEXT loop is put inside another, it's referred to as "nesting" the loops. The important thing to remember is that the last loop to be opened should always be closed first. The following example is wrong and the computer will normally report an error if you try and run it:

```
FOR I=1 TO 10
FOR J=1 TO 5
NEXT I
NEXT J
```

So far, all the loops have counted up, with the counter variable increasing in value as the loop repeats. A FOR...NEXT loop can be made to count down, though, by using the STEP command. For example, the command `FOR I=10 TO 1 STEP -1` will repeat down from 10 to 1, using the variable I as the counter. STEP can be followed by any positive or negative number (within BASIC's



■ Lesson 101, a short database showing the power of loops and branching

It works, but what a waste of time, space and energy. Wouldn't it be easier if you could reuse the command once and somehow tell the computer to repeat it a given number of times?

The value of the counter variable exceeds the finishing value (5 is this case). After this happens, the program continues from the instruction immediately following `NEXT`.

FIRST TIME FOR BASIC

Using BASIC for the first time? Here's how to get the program up and running:

Amiga BASIC first loads the computer and then your Workbench disk into a drive. When the Workbench appears, replace the disk with the Amiga Extras/Amiga BASIC disk. An Extras disk will appear. Double-click on this icon and wait for the command window to appear. Double-click on the AmigaBASIC icon when you spot it. Amiga BASIC is now ready to use.

Now for Power BASIC: Insert either issue 1's cover disk or issue 2's Power BASIC disk and press the reset key. If you're using the cover disk, double-click on the BASIC.BASIC icon when it appears and select Power BASIC from the menu. For the full version double-click on the POWER.BASIC file icon (or BASICC.PRG if using the Amiga BASIC package). You're now ready to roll.

Read the rest of the article to find out how to create BASIC programs.

THE COMPUTER TRADING COMPANY



1st FLOOR

62 WESTTOW HILL

CRYSTAL PALACE SE19

TELEPHONE: 01-761-4667

Software, Computers, Printers, Joysticks, Business, D.T.P, Arcade, Adventures, Mouses, Blank Disks and much more!!

ATARI ST

8 BIT SOFTWARE AVAILABLE

AMIGA

Arknoed II	14.95
Benny Commando's	14.95
Bermuda Project	10.95
Best Cat	11.95
Bomb Jack	14.95
Empire Strike Back	14.95
European Scenario	15.95
Foundations Waste	15.95
Football Manager II	14.95
Fire and Forget	18.95
Flight Simulator II	28.95
Great Glara Sisters	15.95
Jet	18.95
Japan Scenario	15.95
Overlander	14.95
Out Run	14.95
Space Harrier	15.95
Street Fighter	15.95
Winet	15.95
Wizard War	14.95

ALL PRICES INCLUDE P&P

**SEND FOR £1.00
FOR OUR LATEST
16-BIT CATALOGUE**

**IF YOU WANT TO
COME AND
COLLECT YOUR
ORDERS FROM US
PLEASE PHONE
FIRST**

**MON-FRI
10 - 5.30 P.M.
SAT
10 - 3 P.M.**

**MOUSE PAD
£4.95**

**PRO 5000
J/STICK
£14.95**

**QUICKSHOT
II
£9.95**

**ST MOSUE
£22.95**

**PRINTER
PAPER
+
LABELS**

**J/STICK
ADAPTORS
£4.95**

**GAUNTLET
LEATHERNECK**

**3M DISK
DRIVE**

**£11.99
FOR TEN**

LARGE OTTS PHONE

Buggy Boy	18.95
Bermuda Project	18.95
City Defence	12.95
Crash Gameit	14.95
European Scenario	15.95
S.L.F.	15.95
Fire and Forget	18.95
Flight Simulator II	28.95
Goit	23.95
Isat Warriors	18.95
Japan Scenario	15.95
Jet	28.95
Peter Boardwalk	14.95
Street Fighter	18.95
Sub-Battle Sim.	18.95
Strike Force	17.95
Thundercats	18.95
Vigean	13.95
Xenon	15.95

ALL PRICES INCLUDE P&P

**D.T.P
AMIGA**

**CITYDESK 72.95
PAGESETTER 89.95**

**LATTICE C £129
VO.4**

SUPERBASE CP.O.A

**A500
£329
+ V.A.T.**

**A500
PACK'S
AVAILABLE!**

**A500 INC: DEL. PAINT, HACKER II
HITCH HIKERS GUIDE**

1064 COL. MONITOR	£229
1010 EXT. DRIVE	£189
A501 MEMORY UPGRADE	£109

ALL HOME COMPUTERS BOUGHT AND SOLD!

ST'S from	£299.00
C64's from	£59.00
AMIGAS from	£289.00



K GADGET

£29.95 ■ Amiga only ■ Kuma, 12 Horseshoe Park, Pangbourne, Berkshire, RG8 7JW (07357 4339)

The Amiga's intention was designed to be the most flexible RAMP system on any machine (screens, screens - full, but this flexibility comes at a price. If you've ever programmed intuition you'll know that it involves setting up a large number of data structures before you even start to get anything worthwhile. The more complicated your intuition-based application becomes, the more data structures have to be set up and after a while all this can get very tedious indeed. To take the tedious out of intuition, Kuma has released K-Gadget, a program

that allows you to carry out all this setting up from within the comfort of a program's own data.

K-Gadgets is a Gadget and Requester editor that lets you build your Gadgets or Requesters on-screen and then save them to disk either as an ASCII file that can be translated later for further editing, or as C source code for inclusion in your own programs. It file based as C source is automatically given a .h extension. This file can then be called into your own programs with the C preprocessor command, #include.

K-Gadget has the ability to add Position, Proportional and String Gadgets as well as all the attributes of a Requester, such as its position, size, name, borders etc.

When you create a Gadget or Requester, K-Gadget displays a small 'copy' window containing some of all the different Gadget types and of a Requester. To create a particular Gadget or Requester involves clicking

on its icon and dragging it into the work area. Once this is done, all the attributes for that particular Gadget or Requester can be set from the pull-down menus. When all the flags for a Gadget have been set up, K-Gadget allows you to edit its appearance. Requesters too, are well catered for as K-Gadgets allows you to edit their borders and text so your Requester will have that 'personalised' look.

If you already know intuition fairly well, then the time-saving you can achieve using K-Gadget makes it a recommended purchase. If you are just starting out with intuition, you should wait a while before buying K-Gadget as the package assumes you're familiar with the principles behind the environment. If you know nothing about intuition and think K-Gadget will do all the work for you, you're mistaken.

features	4.0
performance	3.8
ease of use	4.0
manuals	4.0
format verdict	4.0



WERCS

£29.95 ■ ST only ■ HiSoft, The Old School, Greenfield, Bedford, MK45 5DE (0525 718181)

Most things RAMP can be built into any shape or size means that can have any number of options. Dialog boxes can fill a few square inches of the entire screen, alert boxes can contain icons, text or both, and icons can be any design. To produce this sort of environment requires a lot of work and a lot of data. WERCS - RAMP Environment Resource Construction Set - allows you to create and edit RAMP resource files which hold all the RAMP data.

Obviously you'll have seen files with the extension .RSC. These are resource files which contain the tree structures defining how a particular program interacts with the user. They are used by GDS RTS (Application Environment Services) for producing

menus, dialog boxes and other RAMP-like things. Each resource file contains one or more trees. And each tree consists of objects of a distinct type, use and appearance.

The first stage within WERCS is to create a new tree. The choices are Icon-Dialog box, Alert, String, Menu

or your exact taste. For instance, objects can be moved and sized, flags (the ticks that appear in standard icons) can be assigned to menu options, boxes can be bordered in various styles, text can appear in numerous colours and sizes, and icons may be edited.

WERCS takes the bottom out of AES programming. It's friendly, user-preference (it even lets you create your own objects) and is the only resource editor available to the public (except



■ Icons can be created for inclusion in dialog boxes. Editing features include flipping, zooming, ANDing, ORing and XORing.

and image icons). From there you can add objects to the tree: boxes, buttons, icons, images, strings, text. Several trees can be held within WERCS; these may be altered at any time. When you're happy with your construction you can save it, along with a header file, and integrate it later with a program in a language of your choice.

That's a brief overview of WERCS: each object can be printed

being of an advantage in itself - full details for technocrats.

features	4.0
performance	4.0
ease of use	3.5
manuals	3.0
format verdict	4.0



■ A desktop showing a dialog box. That's WERCS in a nutshell; it is used to create resource files which contain information on menus, dialog boxes, icons, alert boxes and strings.

BOOKSHELF

USING ST BASIC ON THE ATARI ST

Jack Meadows ■ £7.95, paperback, 180 pages ■ Ginn Press ■ ISBN 1-85181-179-6

Topics covered: simple PBASIC and PBUT commands, drawing shapes, loops and jumps, mathematical functions, arrays and even writing full-length programs.



Jack Meadows is credited with writing many research papers and articles — it shows. The programs detailed are perhaps too practical: measurement converters, income tax calculation and loan repayment. Gossiping stuff that is bound to keep you interested in BASIC programming.

While the book is good for first-time and reasonably competent BASIC programmers, those wishing to access all things GIMP will be disappointed: there is no mention of how to interface with GEM. Perhaps the pages wasted on a foreword by Jack himself, an introduction by the author and a preface by the editor could have been put to better use.

FIRST STEPS IN 68000 ASSEMBLY LANGUAGE

Robert Draine ■ £12.50, paperback, 278 pages ■ Ginn Press ■ ISBN 1-85181-060-1

Many will spend hours arguing the pros and cons of BASIC and GIMP, C and Pascal, Mod and Prolog, but at the end of the day all they really want is something that produces fast, compact and ideally machine-independent code (assuming the same processor). None of the high-level languages really deliver. Assembly language programming is the only way to guarantee that, speeds machine-code programs. 68000 assemblers are available for both ST and Amiga, with the the same syntax on both micros. Ginn's book doesn't assume you have any particular 68000-based computer which is good, but does mean you will need additional literature to access your

particular micro hardware.

Recommended to anyone starting the arduous assault on assembler: Register layout, register addressing, position independent code, addressing modes, exceptions and everything the learner 68000coder needs to know.

C: A DABHAND GUIDE

Mark Burgess ■ £14.95, paperback, 300 pages, Data Press ■ ISBN 1-870336-16-2

One of the few books available that is as useful to the beginner as it is to the experienced programmer. The book takes you through the basics of C in a clear and concise manner, and it includes sections for all the popular machines: ST and Amiga included.

Scattered throughout the book are numerous examples that, are helpful but do suffer from typographical errors — unacceptable in C source.



although there are sections for ST and Amiga, don't expect the book to teach you all about C on your particular machine, these sections can only really be thought of as an added bonus.

AMIGA TRICKS AND TIPS

Black, Mearns, Wether ■ £15.95, paperback, 340 pages, Abacus ■ ISBN 0-85436-66-7

This book incorporates a high level of technical content without losing the safety of AmigaBASIC. Most reference books for the Amiga present the machine either from C or from machinecode. It is therefore nice to find a book that gets fairly technical without leaving the Basic programmer in the dark.

It includes sections on AmigaDOS and the Workbench, and it comes as a pleasant surprise to see the file format discussed in some depth.

If you program in Basic and would like to dig deeper into the Amiga without having to learn other assembler or C, Amiga Tricks and Tips could be just what you're looking for, a must for the AmigaBASIC programmer.



AMIGA MACHINE LANGUAGE

John Commander ■ £20.95, paperback, 254 pages, Abacus ■ ISBN 1-85181-050-6

AMIGA ASSEMBLY LANGUAGE PROGRAMMING

John Commander ■ £13.95, paperback, 232 pages, TAB Books Inc ■ ISBN 0-8306-3713-3

Both books start by introducing the reader to Assembler and then move on to the 68000 and its instruction set. Sadly Abacus's book makes through this important beginner's stage with only a couple of the 68000.

Abacus's book has the most Amiga-specific information, but sometimes detail for content.

The problem with both books is that they list all the routines available in the Amiga ROM kernel, but make no attempt to explain what the routines actually do! Therefore you'll have to buy the ROM kernel manual. Libraries and Devices (which will set you back £20) to be able to use the ROM kernel routines fully.

Both books will teach you 68000 assembly, but for your money, the John Commander book is the one to choose. Abacus's book, although packed with information, does not go into enough detail. It's better to know a great deal about very little, than very little about a great deal.



ORDERING BOOKS

If you want to get hold of any of the books mentioned on this page, why not book them in advance to order? If you do, you can let them know the author, publisher and ISBN number (the standard book ordering system code).

Alternatively, you can go direct: ordering via an ISBN 4-digit Abacus books are available through Precision Software 01-330-11566. TAB books go through any of the following:

00771



By using this web page you agree to the use of cookies by the company of a third party.





Autofiring stick friction

Often on ST will start to make noise for no apparent reason. Typically the machine might refuse to drop menus, typed text flys around and even the loading flies jammed. If you're got an auto joystick plugged in, and it is merely switching noise, then take it out or switch it off this option. The computer receives a barrage of rapid input from the joystick and has, consequently had difficulty acknowledging any other commands.

Janis Williams
Gays, Essex

To close or to close window

File, located on the menu bar, has two very similar commands: **CLOSE** and **CLOSE WINDOW**. The first, **CLOSE**, duplicates the top-left icon of an active window, basically it moves up one directory level (moves out of the current folder if you like) or closes the window if the root directory is active. **CLOSE WINDOW** closes the window to disappear completely regardless of which directory level you're at in the window can needs to minimize the window.

Janis Williams
Gays, Essex

Big dies

Many spelling checkers come supplied with various help files and other utility programs all piling for space on the disk. This has the unfortunate effect of reducing the spelling checker's usefulness as user dictionaries can never grow to full capacity. Simple solution: copy the dictionaries onto a blank disk. This will let them grow unhindered.

Janis Williams
Gays, Essex

Cadbury's caramel cursor keys

If you're using the Information cursor key combination to emulate mouse movements, try holding down **Shift** at the same instance. You'll find that the pointer moves in smooth pixel increments.

Rail Wilson
Whitewash, Cambridgeshire

Bios discovery

The device code for the IBM BIOS call **IOCALL** (map #13, function #5), according to Bentley's reference guide, should be between 0 and 4. However, if 5 is used, the output device chosen is the screen which enables the full Atari character set to be displayed, and not just ASCII symbols.

BEGINNER'S CORNER

FILE NAMES

If you have investigated the contents of disks, you will have probably noticed that file contents of a maximum eight character name, a full stop and a possible three character extension follow. The three character extension can tell you a lot about a file.

DOC - usually a help file which contains information about a program or disk.

EXE - a DOS program file. Double clicking on this causes the program to start.

FIG - a Format Operating System file. That is, a program that doesn't make use of the MS-DOS environment. Double clicking on a file with this extension causes it to start.

FTP - MS-DOS parameters for the disk just that. Clicking on this type of file results in a menu page asking you to enter some information for the program to

run.

MOD - an accessory file. These can't be run in the usual way, the file had at least one file present in the root directory (like **font**).

MPG - a music file which contains data (not just information, it can be a song generally).

MS2 - **MSDC** files as used by ST BASIC.

Double clicking on any file with an extension other than **TBL**, **MPG** or **FTP** will cause a window to pop-up asking you to show **Print** or **Cancel**. (Show will display the contents of the file, or **Cancel** sends the file to printer and **Cancel** takes you back to the Desktop).

DELETING FILES

Cautionary operation this if used unwittingly. To delete a file, select and drag the required file or files to the trash bin and

dump them there. A prompt will appear asking you to confirm the deletion. Click on **OK** if you are positive you don't mind losing the file. Remember, once you have something, it is gone forever.

RENAMING FILES

Select a file by single clicking on it and enter a file in the menu bar. Select the file from the resulting menu. A dialog box will appear requesting the new name of the file. Be sure it spans the time it was last modified and its attributes (read, write, execute).

Change the name by pressing **Delete** or **Esc** and then typing in the new name. Filenames can be up to eight characters, optionally followed by a full stop and a three character extension. Be very careful not to change the three character extension as you might not be able to run the file again. Press **Return** or click on **OK** when finished.



BOOK.DOC 0 bytes 78 40-210
128414 bytes 50 04 0401
0401-04 04-04 04-04
128414 bytes 78 40
128414 bytes 50 04 0401
0401-04 04-04 04-04

128414 bytes 78 40
128414 bytes 50 04 0401
0401-04 04-04 04-04

Martin Pryor
Oxford, Peterborough

WIN MONEY: LOADSAMONEY!

Yes, you have the chance of getting your name on loadsamoney! And at what cost to you? A few hours of time or getting the best out of a software package, or a hardware modification, or how to use the Internet more effectively, or anything you find will interest other users of ST money.

The first money each month will go to that name and great wealth (over £2000) will be yours. So come on, share your secrets with all 5000 other readers. And perhaps STB by your lucky day. Rush your 5000 to loadsamoney, ST/Money Forum, 4 Queen Street, Bells, BH1 1LJ.

Public Domain Software for the Amiga

from £3 per disk all inclusive

- Membership not necessary
- Fast service

We have one of the largest collections
of shareware for the Amiga in the UK.
We currently stock:

- 3 FILE 1.00
- 3 ABOUT 1.00
- 3 SLIPPS 0.00 1.00
- 3 FALLOUT 0.00 1.00

All the above are 512kbit - 1.1MB
when you order 10

Checkmate disk £1 available for £5

APOL special editions (Batteries
and Laser) prices £10 each plus 1 FREE
when you order 10, or £1 each for
members of the Amiga Users Club.

Our own special selection

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• C/VIDEO, 40 COL 100.0

• STOP PRESS •

Just in from the USA, Portland, USA, from Germany, 1.00

Checkmate disk £1 available for £5

Selection of PD software also available for about £1. Please write or phone for a list.
Use the latest information in giving our own club details or phone for details.

THE AMIGA PD LIBRARY
140 Rushdale Road, Sheffield, S8 3QE
PD Hotline 0743-588429 (9am-9pm)

The ST Club

Caters for all - Beginner to Professional

Newsletter

Packed with news, reviews, articles, hints and tips, programming
articles, free classified adverts, and more. Now 28 pages in A4
format, produced using DTP software and an A4 Laser.

Single issue £0.95 • 12 issue subscription just £5.00
(subscribe now - freeable to £3.00 in July)

Disk Magazine

Containing the best and latest Public Domain Software.

8 issue Disk Mag and 16 issue Newsletter subscription £20.00

Public Domain Software

Over 250 disks at the last count. All available on quality formatted

single and double sided disks from as little as £2.00 each.

Return the coupon below for a free copy of the latest PD catalogue

Members Discounts

on PD disks, commercial software, books, accessories etc.

Laser Printing Service

From 10p per page - Return the coupon below for a price list.

Often Cloned - Never Betrayed

Please supply: ☐ Subscription (Newsletter / Disk_Mag)
☐ Sample Newsletter (80p) ☐ Sample Disk_Mag (£2.00)
☐ FREE PD Catalogue £ • Cheques / PO enclosed

NAME: _____

ADDRESS: _____

Post Code: _____

The ST Club • 6000 House • 10 Collins Wood High Street

Wimbledon • London • SW15 5AE • Tel (01) 545 5500

Not available in European orders - Other countries add 10% for air mail postage

....FREE MEMBERSHIP!....

For Free membership of the fastest growing ST/Amiga User Club simply select any of the discounted titles listed
below. Membership entitles you to many special services and also a regular PD library update on disc form that
includes superb demos, art, music as well as news and gossip. Thousands of 16 Bit users have already tried us
and are over the moon with the outcome - Try us NOW!

ATARI ST

TITLE	RRP	OURS
Overlander	15.00	14.95
Arkworld II	15.00	14.95
Jet	20.00	32.95
Summer Olympics	15.00	14.95
Virus	15.00	14.95
Dragonair Master	24.95	17.95
Subvinder	5.00	7.95
Legend of the Sword	24.95	17.95
Corruption	24.95	17.95

COMMODORE AMIGA

TITLE	RRP	OURS
Battle Tale II	24.00	17.95
Sentinel	10.00	14.95
Sam Warrior	24.00	17.95
Bermuda Project	24.00	17.95
Buggy Boy	24.00	17.95
Sonic	27.50	44.00
Phoenix Point	50.00	34.00
Pro Sound	50.00	34.00
Interceptor	24.00	17.95

The above titles are only a tiny part of our range for the ST/Amiga. Please call if the title you require isn't shown. ALL
software shown is available and advanced orders can be taken for any title not yet released.
We have a large library of the best PD available for the ST/Amiga, each PD disc is just £2.50 inclusive. The library is
on disc form and is also a forum for members ideas, letters, hints etc as well as the latest demos and programs.

You may also get free membership by ordering our latest update for your machine, at just £3 this
is great value! "...the best thing to happen to the Amiga..."

17 BIT SOFTWARE

P.O BOX 188, LEEDS LS1 4BS, TEL 0532 426643

"That Bit Better Than The Rest"

Access and Visa welcome 9.00am - 5.30pm Mon-Sat



WORKBENCH

Mystified by the manuals? Flummoxed by the files? A pair of pages to aid Amiga owners in their struggle against visits from the dreaded Guru. This month's £30 prizewinner is John N. Bloor for his multi-coloured tip on enhancing the look of text files on screen.

Multi-coloured bobs

If you're a BASIC programmer and you're interested in getting the most out of the Amiga's graphics system, you've probably experimented with Sprites and Bobs. Amiga BASIC comes with a utility called the 'Object Editor' to help you design these handy little devices.

The standard version of the Object Editor only allows you 4 colours on screen at once. It is possible to get 8 or even 16 colours though, depending on the amount of memory you have. With 256K you can only use 4, fitting all Amigas, including early 1050K. With an A500 you can certainly get 8 colours onscreen, and maybe 16 if you're lucky.

What you have to do is edit the Object Editor program, which is kept within its Amiga BASIC, to remove the comment markers from a few vital lines so the program actually uses them. The extra colours only apply to Bobs, not Sprites, which are limited to four colours anyway.

If you've got more RAM, you could try opening the colour content of Bobs to 16. As well as un-commenting the lines as shown in stage 5, change the line `Copy b=3 to Copy b=4`. This gives you 4 bit-planes, hence 16 colours. Be warned though that if the Object Editor runs out of memory on account of there being too many bit-planes, your Amiga will crash!

Hidden pictures and music

If you put your Amiga from the Data Shop, it's likely that you have 1.0 PD (Public Domain) disks as well. On PD disk 8 there are some hidden pics, and you can find them by pressing certain keys while the slide show program is



■ 1 - Put the 'Extras' disk in the drive and open up the 'ObjectEditor' drawer.



■ 2 - Double-click on 'ObjectEditor' to run it.



■ 3 - ObjectEditor starts up, and the program begins to run. Press (Ctrl) to interrupt it, then choose 'More Col' from the 'Window' menu.



■ 4 - Resize the bit window so you can see it all, press (Shift) cursor down to scroll the editor one screen-down, and you'll see six lines beginning 'if Bobs are to be created...' with quote marks before them.



■ 5 - Remove the quote marks from the bottom four lines, and choose 'Start' from the 'Run' menu.



■ 6 - Once you're into the program, type 'F' to select Bit colour (not Sprites colour), and you'll see the colour palette at the bottom of the screen now has two right colours.

nothing. Almost every letter from A to Z has a picture for it – there are about twice as many images as you would see if you let the text flow out normally.

Also, if you have OMCS (Deluxe Music Commander) installed and wish to use the sound effects on the disk 4 then try this. Load OMCS, pull down the Measures menu and go to GET BATTERY-LEVEL. A window will appear. Clear the two boxes at the bottom by clicking in them and clearing any text. Insert the disk 4 in drive C, click on the box which says C90, and a directory of the disk will come up in the window. Go to the bottom of the list and click on 'Sounds'. The sounds will appear by name on the screen – click on the one you want – say, 'Hiss' – and use this as a new command.

Some effects are great, but cannot be done by the user!
Amiga Report
Barnet, Herts.

These messages!

It seems to be almost common knowledge that the original developers of the Amiga – the Amiga Corporation Inc. – left some hidden messages in the system software when they sold it on to Commodore.

Just in case you get the urge to look these 'hidden' notes, here's what you have to do. Boot your Amiga up to you get to the Workbench screen. Click the window anywhere in the screen left to make sure it is active – the amount of free memory shown in the title bar. Hold down both (Shift) keys and both (Alt) keys at once. Press each function key in turn and you will see credits for the designers appear in the title bar.

Now for the story; you might need the aid of a third hand for this and with the four (Shift) and (Alt) keys still held down, hold down (F1) and next the Workbench disk from the drive. Keeping all the keys pressed, put a different disk back in the drive and you will see a message which Commodore will probably remove from future releases of Workbench!

Stephen Knight
St. Martin, Jersey

More fonts

If you're managed to acquire a disk with some extra Amiga fonts or it, maybe from the Public Domain or from a commercial package with a variety of fonts, you may experience difficulties getting some programs to recognise the new character sets. This is because when the Amiga first

if you're writing a text file to appear on the screen, for example as a set of instructions for someone to use your program, there is a lot you can do to make the presentation a bit snappier.

The trick is to embed 'ESC' codes in your text. These are special codes which, when the Amiga's screen controller reads them, cause the following text to be printed in bold, italic, underlined, or a different colour. The new information you need is hidden in the rather terse Appendix D, 'Printer Escape Codes', at the back of the ordinary Amiga manual.

You will see that this appendix takes the form of a table of lines like **ESC B** (ESC is the letter 'B' preceded by a backslash) to ignore the first column headed 'Letter'; the important information is that ESCape (ESC is the ten-bit-coded command).

There are several ways to use these codes. The most straightforward is with ECHO commands in an Execute file. Using EDC, or any text editor you want, create a file called FRED containing the line **EDC B "Here is some text."**

Now when you run this file by typing **EXECUTE FRED** at the CLI

you will get 'Here is some bold text' appearing on the screen. The characters 'B' are treated as 'Toggle' by the ECHO command, so 'B' in the string is equivalent to the ANSI 'toggle' command. In the screen shot shown you will see quite an involved set of commands to switch colour, underline and so on.

Here is a list of the most useful ANSI escape commands. Note that not all the commands in appendix D actually work – most are intended for use with printers rather than the screen, so things like 'LS' line spacing have to be omitted.

table { border: none; }
tr> ESC C | Clear the screen || ESC D | Station on |
ESC E	Station on
ESC F	Underline on
ESC G	Underline off
ESC H	Hold on
ESC I	Hold off
ESC J	Cursor up
ESC K	Cursor down
ESC L	Cursor right
ESC M	Cursor left
ESC N	Blue text
ESC O	White text
ESC P	Black text
ESC Q	Orange text
ESC R	Blue background
ESC S	White background
ESC T	Black background
ESC U	Orange background


■ ANSI codes embedded within ECHO commands. Don't forget to put a CRL code at the end and to reset the text to normal.



■ End the message.

to load its fonts it always looks in the 'typical device' called FONT0, which in practice means the directory FONT0 on the disk you boot at the machine with.

You can, however, make it look elsewhere for its fonts. For the sake of example, suppose that your new fonts are in a directory called FONT00 on a disk called MDISK. You can tell what a disk's name is by looking under its name on the Workbench screen. Before you run a program – whether it's already run from the Workbench or the CLI – open up a CLI window and type at the command prompt these lines (for detail of how to open up a CLI win-

dow, if you aren't sure).
device FONT0;
device FONT00;

Now you can close the CLI if you want to and run a program which uses fonts as normal by clicking on its icon – this certainly

works with Deluxe Paint, as an example. When you choose the load fonts option from the relevant menu you will be asked to insert MDISK in the drive and your new fonts will then be loaded.

For EDC, type 'B' when using the ECHO command. There are many ways other than by using ECHO to get text to the screen.

Unfortunately, the Amiga's standard text editors ED and EDT don't allow you to put escape codes directly into files. You could use the ECHO command to create a text file with escape codes: at the CLI prompt, type

```
cd C >> FRED
type test file FRED here,
pressing the (Esc) key for ESC in commands
(Ctrl+V) to finish.
```

Then more ECHO produces the results for you.

Alternatively, if you are in a programming language like Amiga BASIC you can output text with the PRINT statement. Use CHR\$(27) whenever an ESC code is called for: **PRINT "Here is some text"; CHR\$(27); "B"; "bold text"** has the same effect as the ECHO statement used earlier.

John H. Bosman
Cape Town, RSA

WIN £30 A MONTH!!!

Free magazine made just if you know of any good tips for the Amiga. We want to know. Whether it's software CD commands, handy recommendations then the Workbench or tips about specific packages, we could have your genius exposed in 40,000 readers a month. And come on, gentlemen, you must have a few secrets up your sleeves: handy substitutions, neat tricks, don't keep them in your attic.

Send your tips to: **WORKBENCH, BY AMIGA PUBLISHER, 4 QUEEN STREET, 2ND FL. B&B CL. As if the horror of appearing in our pages wasn't enough, the free tip each month wins a £30 in hard cash.**



GOLD DUST

Transatlantic secret agent Steve Gold brings news of Atari's new factory, transputers, Macintoshes and more for ST and Amiga.

Some good news for ST users who had difficulty buying their machines during the ST shortage earlier this year. Atari is negotiating for the purchase of a 700,000 square foot video games factory in Houston, Texas.

If the deal goes ahead - and it looks like it will - the Houston plant will ease the load on other Atari facilities, thereby allowing increased ST production. For US Atari consumers, this will improve supplies of the ST, which in turn will make for better discounts from dealers.

For those of you who already own an ST and aren't thinking of upgrading to a Mega, Steve again has news. Sources suggest that a 64000-based super-ST is on the way. The 68030-based machine is scheduled for a September 7 October launch in the US (Europe - fall).

The super-ST is expected to be downwards compatible with the existing STs and, based on previous performance, there's every indication that the machine will be announced in the UK, though not released at September's PC Show at Olympia.

Also on the horizon is a third-generation games console. The machine will be launched in January 1989 and feature an in-built 68000 microprocessor. The price will be \$1099, which equates to about £129 at current exchange rates. As machines will already have purchased, the games machine will probably be a stripped down 120011M, minus keyboard and possibly disk drive.

Alternating currents

Over at Atari's US headquarters, an interesting subterranean is developing between Neil Harris and Sam Tramiel. Harris left a message on Commodore's Atari team to the effect that Atari is resuming its US merchandising of the ST. Distributors are now apparently being left out in the cold, and the company is concentrating on improving sales reps in

the field. Understandably, this message has caused concern among Atari users, many of whom rely on distributors for technical advice and backup support when their dealers can't help them with their inquiries.

A week or so later, an open Sam Tramiel, MD of Atari, saying he was "disappointed by the negative letters and articles regarding comments made by Neil Harris."

The consensus of opinion in the US Atari ST community is that users cannot expect much assistance from ST dealerships and, if they want support, they will need to buy their machines from full-price retailers. UK readers would do well to note this point, given the number of special offers on the ST which are currently being advertised.

Sac - the hit

These Amiga users who've been looking anxiously at David Small's Magic Sac Macintosh emulator for the ST will be pleased to know that it's now working on a Mac emulator for the Amiga. Unfortunately, Small is reported to have encountered a programming problem with the Amiga's memory map, with the result that initial versions of the Amiga Magic Sac for all almost certainly be limited to 256K Macintosh programs.

There isn't much Mac software that will run in a quarter Meg, so until Small or someone else completes the memory map problem, it looks like a Magic Sac for the Amiga will only be of limited interest. Don't despair, though. Small says the memory problems only affect the A500 machine. As long as your Commodore got around to increasing the 68000 Amiga's system memory to 1MB, and/or users start installing extra RAM on their machines, a workable Mac emulator for the Amiga becomes viable.

Taking a realistic view of things, it seems unlikely that Small will market a Magic Sac for the Amiga until 1989. Amiga users are available, a 68000 users will probably be disappointed when the

Amiga Magic Sac finally appears, since their machines don't have the necessary capability to drive one megabit RAM chips.



■ In Apple Macintosh. Could the Amiga run its software soon?

Software seen?

Mega Software, a doubt is whether its long-awaited Atari 68000 source level debugging package for the Amiga. The 500 package should be available in the UK through a number of distributors by the time you read this.

Interestingly, although there are no current plans to release the Agetec debugger on machines other than the Amiga, Mega do say that the package will run on most other 68000-based macs. This could be a chance for budding technical boys to port the

package over to the Apple Macintosh or Atari ST environments.

Amiga owners with access to a modem will be interested to hear that Harris, a new US call centre house, is developing a 2400 communications package called Amicomm. Amicomm is provisionally scheduled for a very late 1988/early 1989 release and seems to be way ahead of any other Amiga communications software. Amicomm features which may be subject to change include X, Y and Z Modem file transfer, as well as 4000 and Kermit facilities.

Also included in Amicomm's long list of features is a variety of terminal emulations, including VT10, VT52, VT100, and AROS. In addition, the package includes a call logging facility so you can check your phone bills when they come in. Amicomm also supports remote program facilities. For simplicity, this means you can dial into your own or somebody else's modem-equipped Amiga, and run programs on that machine. The resultant text-mode screen display is then echoed down the phone line, so is data to and from the machine's screen, printer and/or disk drive. Amazing really at just \$495. Look out for Amicomm in the imported software lists soon.

Putting the Abaq back

On the transputer front, the Abaq continues to attract interest in the UK. Sources suggest there are currently 50 machines in general use with architects, and a further 200 were installed during July.

There are strong reports that the Abaq will be on sale on both sides of the Atlantic by the end of the year, although much rests on the work of Parthenon, the company responsible for the Abaq's multi-link operating system, Helios. A spokesman for Parthenon has been quoted in a trade paper as expecting Helios to be available by this October.

■ Atari's long-awaited Abaq: Parthenon is busy building up Helios for Parthenon to finish the operating system, Helios.



THIS MAGAZINE IS RUBBISH.

DISK BOXES AND MOUSE MATS ARE USELESS.

THE SPECTRUM IS THE WORLD'S GREATEST COMPUTER.

If you agree with any of these statements, please turn the page now. For those still reading, we'd like to make an offer you'll find hard to refuse. Take out a launch subscription to *ST Amiga Format* and we'll send you a complimentary gift pack, consisting of a high-quality, hard-wearing mouse mat (RRP £5.95) and a smart, lockable disk box capable of holding 40 disks (RRP £12.95).

A 12-issue subscription costs just £29.95, and that of course includes a disk packed with software on every issue.

We hope you'll agree that *ST Amiga Format* offers spectacular value for money and provides valuable coverage of all aspects of your computer. If so, you'd better guarantee yourself a monthly copy, because you can be sure of one thing: the magazine won't be hanging around long on newsagents' shelves.

NO QUIBBLE GUARANTEE

If after receiving three issues of *ST Amiga Format* you decide you no longer wish to subscribe, you may write to us and claim a one day refund for all outstanding issues - you would still be able to keep your gift pack.



FREE WHEN YOU SUBSCRIBE!

- Smart, high-quality **disk box** holding up to 40 5.25in disks.
- Hinged, smoked perspex, lockable lid keeps away the dirt.
- Supplied with dividers for easy disk filing.
- Normal retail price £12.95.

plus

- High-quality, hard-wearing **mouse mat**.
- Rubber base, nylon top for smooth mouse movement.
- Helps prevent mouse getting clogged with dirt.
- Normal retail price £5.95.

HOW TO ORDER

Please use the **FREEPOST** form on the following page or the identical card attached to the outside of the magazine. Alternatively dial 0800 716711 with your credit card details.



CARRIER COMMAND

Platform

Take command of the world's most advanced multi-role assault carrier engineering futuristic 3D field graphics.

Version	BBP	Our price	Order code
Atari ST	24.95	19.95	PC000487
Amiga	24.95	19.95	PC000488

VIRUS

Platform

The ST version of the game which first appeared in Zaxxon on the Archimedes is even better than the original Format Gold.

Version	BBP	Our price	Order code
Atari ST	24.95	19.95	PC000507

LEADERBOARD

US Gold Access

The going simulation par excellence - 18 titles depicted in great detail, superb animation, long-term challenge.

Version	BBP	Our price	Order code
Atari ST	24.95	19.95	PC000751
Amiga	24.95	19.95	PC000752

SPACE HARRIER

Title

This conversion of the Taito coin-op game has won a Format Gold award.

Version	BBP	Our price	Order code
Atari ST	19.95	14.95	PC000317

OBDS

FTL/Microsoft

You've been tortured by the demons on our cover disc, now try Format's, complete with two galaxies each with up to 4 planets, a game-designer, modifiable maps, and other funs each time.

Version	BBP	Our price	Order code
Atari ST	19.95	14.95	PC000607

ROLLING THUNDER

US Gold

Impressive conversion of the Namco coin-up featuring a cyberpunk and high-tech vision of war.

Version	BBP	Our price	Order code
Atari ST	19.95	14.95	PC000607
Amiga	24.95	19.95	PC000608

DUNGEON MASTER

FTL/Microsoft

Enter the infamous war dungeons if you wish in this incredible role-playing adventure. Astonishing 3D graphics, incredibly detailed graphics.

Version	BBP	Our price	Order code
Atari ST	24.95	19.95	PC000607

GAUNTLET 2

US Gold

Follow up to the arcade classic - the new dungeons are double that from the first.

Version	BBP	Our price	Order code
Atari ST	19.95	14.95	PC000607

OUTRUN

US Gold

Conversion of the going smooth to make racing games.

Version	BBP	Our price	Order code
Atari ST	19.95	14.95	PC000607

WHIRLYGIG

Platform

20 light source and 64000 pixels make this a sure Format Gold winner.

Version	BBP	Our price	Order code
Atari ST	19.95	14.95	PC000317

JINKS

US Gold

Incredibly addictive, hypnotically swirling feature with up to 160000 sound effects.

Version	BBP	Our price	Order code
Amiga	24.95	19.95	PC000608

S.T.A.C.

Platform

The ST Adventure Creator is a remarkable piece of software allowing you to create sophisticated, commercial standard adventure games, complete with graphics.

Version	BBP	Our price	Order code
Atari ST	24.95	19.95	PC000607

INTERCEPTOR

Electronic Arts

You've seen it on the cover disc, now buy the real thing. Incredible, fast 3D graphics, numerous different views of the action. The greatest combat flight simulator yet.

Version	BBP	Our price	Order code
Amiga	24.95	19.95	PC000608

EPYX ON ST

US Gold/Epyx

Now, superb value simulation of three great first person games, Super Cobra and Championship Wrestling.

Version	BBP	Our price	Order code
Atari ST	24.95	19.95	PC000607

FERRARI FORMULA 1

Electronic Arts

Superbly detailed simulation of the formula one championship. Numerous circuits, car preparation, high-speed racing, etc.

Version	BBP	Our price	Order code
Amiga	24.95	19.95	PC000608

BIONIC COMMANDO

US Gold

The Capcom arcade game which won the title of the world depending on the performance of the winners of the format.

Version	BBP	Our price	Order code
Atari ST	19.95	14.95	PC000607



STAMIGA

FORMAT

READER OFFERS

Fantastic savings on some of the hottest 16-bit software around!

Fast delivery • Friendly service • Fabulous discounts

HOW TO ORDER

Just make a note of the details of the items you want, including the offer code. Then fill these in on the free-post form printed on this page, or use the identical perforated card attached to the back of the magazine.

Post this, together with your credit card details or cheque to the Free Post address listed — you need pay no postage.

Alternatively ring 0458 74011 and ask for Format Credit Card items.

PLEASE NOTE

All items are dispatched by first class mail.

All prices include VAT, postage and packing.

You will normally receive software within 7 days of ordering.

CREDIT CARD HOTLINE

0458 74011



ORDER FORM

Please rush me the following items from the ST Amiga Format special offer pages.

Order code	Title	Price
1.		
2.		
3.		
4.		
5.		

Total Software Order £

Send this form to:
FORMAT Offers

FRANKIE
ROBERTSON

Formref: 74011/74011

No stamp required if
posted in the UK.
Cheques payable to
Format Ltd.

SUBSCRIPTION ORDERS

☐ Tick here for a 12 issue subscription to ST Amiga Format costing £25.00. This entitles you to a FREE disk box + mouse mat.

Subscriber's total payable £

Name

Address

Phone (if post) Computer

Method of payment ☐ ADDRESS ☐ CHEQUE ☐ P.O.

Credit card no. Exp. date

Please make all cheques and postal orders to Future Publishing Ltd
This form is valid until September 2000, 1999



READER OFFERS

Our selection
of the best
applications
software packages

POWER BASIC Atari ST - £39.95 - HiSoft

One of the frustrations Atari ST owners face is the relatively poor Basic supplied with the machine.

HiSoft's Power Basic is a far better bet and offers programmers immense power, which is why we've made it the basis for our Basic programming course.

The demo version on the August issue cover disk shows you just what the package is capable of — check out these features:

- Much faster than ST Basic.
- Compiler creates stand-alone programs.
- Unlimited string length.
- Complete AES and VDI access.
- Joystick access.
- Quick reference card.
- Multi-line statements.
- Load and save resource files.

FREE SOFTWARE!

A disk containing powerful Atari ST utilities is yours when you order HiSoft Basic through this magazine.

The full package includes a large manual (plus the ability to Load and Save which have been disabled in the demo version).

If you're serious about programming, this is the program you need.
Order Code: PG218T

POWER BASIC

Advanced Version 1.00

Atari ST Computers

HiSoft
High Quality Software

HOW TO ORDER

To order any of these packages, just turn back one page and fill in the Order Form. Or telephone us on 0458 74011 for a Credit Card order.

DIGICALC

Atari ST and Amiga •
£39.95 (RRP £39.95)

This spreadsheet from Digis International has already established a reputation for itself on both the Amiga and the ST. We need say little more about Digicalc since not only have we reviewed it, but a demo of the ST program is included on the August issue cover disk — so here's your chance to really try before you buy!
Order Code (ST) PG208T
Order Code (Amiga) PG208AM

DELUXE

Paint



DELUXE PAINT II

Amiga • £69.95 (RRP £69.95)

This is something else — Electronic Arts' graphics program which comes from the US with gushing, almost embarrasing, glee. You can paint on a 'canvas' that is bigger than the monitor screen — 1008 by 1024 pixels, with 32 colours in low resolution or 16 colours in high resolution. Full percentage colour mix is possible, including hue, saturation and contrast for each colour. Full zooming in is possible, with special animation effects including Colour Cycling which offers almost cartoon-like movement qualities. There's an unlimited variety of paint brushes you can use, a complete set of shape and line tools, and a range of special effects which will let you create banners, calendars, cards, newsletters — anything can be done with a splash of style.

FREE DISKS

A pack of 8 high-quality CDROM hard disks is yours when you buy Deluxe Paint II from us!

which is the result of a program which really lets your imagination loose. Try it — you won't be disappointed!
Order Code PG23AM

CREDIT CARD HOTLINE
0458 74011





FORMAT LETTERS

It just keeps on growing. As our mail sack bulges, so the number of pages of your letters increases. All sorts of quandaries, queries and quips have been sent to: **FORMAT LETTERS, ST AMIGA FORMAT, 4 QUEEN STREET, BATH BA1 1EJ.** Why not send yours in, too?

Getting more from RAM

There are a couple of problems with the RAM disk utility from Alan. Firstly the loading message is wrong as it assumes you are in mode rom, which I am not. Also, it doesn't let me use my software to be run from mode the RAM disk. It is quite useful for copying things. While this isn't really as well as software being able to add a lot more flexibility to programs for the ST, like the RAM disk program, it just tells you that you have a 2048 RAM disk and if you want to change the size as well, sorry money you can't.

Why don't programs use the DOS and often look orders - it would save owners of the new ROM-machines a lot of bother?

Jonathan Small
Bromley

■ The RAM disk program is PD and we pass the code and documentation on including instructions on changing the drive size to 'it', which we're obliged to do. It doesn't take a lot to switch installation from the performance menu, though. Most games refuse to work from RAM disks as an antiquity measure, but many applications have options to configure their programs to work with a variety of drives.

Printers on line

"Could you have a survey on printers in your magazine? I wish to purchase a printer (ideally a Star LC118 for my Amiga) and I also want to use it on my dated G4. Is this possible and if so, do I need any extra tools?"

How come that software for the Amiga is more expensive than

that for the ST? When I purchased my G4 the software was a few pounds cheaper, now I have the same problem with my A400. For example, in your first issue interpreter for the Amiga was £24.95 and Virus for the ST was £19.95. Surely a Commodore want to be No 1, then they should keep the prices closer together, to encourage higher sales.

J.J. Hocking
Farn, Cornwall

■ It's not looking at hardware editors. During the coming months, you can use the Star printer with both machines, but you will need separate, plug-in, interface cartridges for each: a Centronics cartridge for the Amiga and a Commodore-specific one for the G4. You'll also need leads with the correct connectors for each. This system of cartridges doesn't apply to all manufacturers, all check before you buy.

It's not really fair to compare different games from different manufacturers. Although there's still some discrepancy between ST and Amiga prices, more and more are being released at the same prices. Commodore has very little control over the pricing of games from independent software houses.

ST to BBC

I have an Atari 5200STFM and I am using a TV for the display, but want to use a monitor which has a BBC lead. I have seen advertisements for Philips monitors with Atari leads and I was wondering if I could buy a lead like that and connect it to the BBC monitor, therefore using it with my Amiga. If I can, would it be a better quality of picture?

Ben Bellish
Cardiff

■ Assuming your monitor is the standard Monitronic type sup-

plied with most BBC Monis, it won't work with your ST as it needs TTL level RGB input and not the linear levels used by Atari. You would also lose any sound output from the ST, as the Monitronic has no speaker.

Q and A

I don't own a 16-bit computer yet, but I am hoping to get an Amiga A400. I would be grateful if you could answer the following questions for me.

1. What is the Workbench? and what's CLUT?
2. What is the RAM disk?
3. Why does the software for the Amiga and ST cost so much?
4. When you buy the Amiga, should you get the Workbench disk with the computer?

Faustina Mirza
London

■ By then:

1. The Workbench is the GUI-based interface to the computer which sets Windows, Icons, Menus and a Pointer to WIMP) to make working with the machine easier than having to learn a series of commands. The GUI (Command Line Interface) lets you type in the commands that the Workbench has to avoid, if you're determined to do things that way.

2. A RAM disk is an area of the Amiga's memory set aside to mimic a disk drive. It's particularly useful for copying files on single-drive micros, as it's a lot faster than a real drive. The Amiga's RAM disk is particularly clever, as it expands and contracts automatically to store whatever you put into it.

3. Because you're comparing it with a bit more computer power. Compare it with business software on the IBM PC and it looks cheap.

4. Yes.

AT SCREENING POINT

I have only had my Amiga for about two months, and bought it to do my husband's accounts on. Unfortunately, I haven't had time to do them yet as I am too busy playing games on it. At least it's a good bit more fun. Well, let's get to the problem, when I first bought my machine, I purchased Microfilm's Guide to the Galaxy, I am stuck, and after two months of desperately trying to figure it out I've decided to ask your expert advice (sorry, creep). When you are in the Heart of Gold and everyone wanders off, what are you supposed to do? The story that Marvin keeps wandering off through will not let me through, I have begged, pleaded and told it that I am a Superior Being, all to no avail - to please, please tell me what to do.

Raven Smith
Carmarth, Wales

■ You're not going to like this, but the screening door's a real bummer. Spend your time instead building an impenetrable force field, a nice cup of tea could help.



C compiles and dies!

Since my upgrade, last Nov., I have been toying away Amiga magazine that I could lay my hands on. When I saw your magazine with a hard disk, for is it a disk with a hard magnet for the same price, I thought, "Well, if the disk is no use I can at least reformat it."

Surprise, surprise! Your magazine just makes all the rest look like run of the mill sissy guff. I am teaching myself to program in C, using Lattice C 14. Although most programs work, I still get into problems.

One of my problems is that the program compiles, links, and then asks for default values on such and such "data". No I do not understand this, when the programs are run via the GUI, I have a responder telling me that I have a syntax error, and to stop all disk activity. Please help me!

Mr. S.J.G. Reeves
Lithium

■ We've come across this problem, too, and like you, are confused by it. Basically, you haven't got the correct libraries open when you link. If you use any floating point arithmetic or sound routines and the like, you'll need to use an extra maths library, so that could be it, instead of trying to reformat the disk. (S.J.G.)

Sounds good to me

I have owned an Atari 800X for 2 years, now, and recently 'upgraded' to an Atari ST. I was amazed when I saw the screen shots in *Format* and other magazines, and with a loan from my parents I purchased an ST. I was very upset at the way some of the games moved—in particular the scrolling on some games is very jerky (which I mean was on the 800X) and when there are several moving objects in the game it becomes very slow. Also, in your first issue I was very disappointed to read that the Amiga sound chip was far superior to the ST's. Do you think I should sell my ST and buy an Amiga (as it stands I would rather have kept to my old 800X)?

Peter Brady
Walsley Garden City

■ I don't know which games you're talking, but my feature to Genesis or Commodore is just examples of good ST scrolling. The graphical complexity of current 26-bit games is so much greater than anything on the

In sequence

I am at the moment toying with the idea of buying an Atari ST. My main aim is to use it for MIDI music, and therefore I would appreciate any information you have on MIDI sequencer software. I want something decent but not too pricey or spectacular—I would never make use of the 34-track Steinberg software. Ideally, I would like a program for the 1000T and one with not more than 16 tracks.

Nigel
Widham

■ Have a look at the illustrated *Super Conductor* or the *Hybrid Arts EasyScore*, both around the £50 mark.

Hitting the buffers

I have made great use of Amiga Sonic 2.0 software when I am composing on my Amiga 1000. I am quite pleased with the results so far but there are problems and despite writing to the American company twice I have received no reply.

I am using a format 10000 on all four MIDI channels but when I ask it to change patches on a long composition I get the message 'MIDI BUFFER FULL' on the 10000 display. I have tried everything to get around this but with no success. I can make it change patches on short, brief pieces of music but it will not

MUSICAL CHAIRS

work on proper songs. I am of course sitting at 4 MIDI channels to the same channel and patch as the fourth is not available.

Ian Martin
Maidstone

■ Perhaps we're missing something, but we can't see any reason for naming a mono-channel instrument from 4 MIDI channels—surely one would be sufficient, and might not confuse MIDI so much. The 'MIDI BUFFER FULL' message is not uncommon on MIDI output, and reflects the fact that the transfer rate for MIDI packets is not fast enough to keep up with the data when complicated patches are being used.

MIDI muddle

I have recently become involved in a music application with a few friends. As I thought, MIDI now I can utilize my potential as a recording sequencing etc. studio. However, I could not make my last my ST's potential since all MIDI information tends not to answer some obvious questions. For example, assuming you have software that will function in conjunction with your computer as an 8-track mixing desk, how long a track can one disk hold? How do you record to tape, for playback? Software shop assistants are not much help either, so in desperation my friends

gave up and purchased the Aminal four-track recording studio. So far, so good?

Do be cautious, any disk eventually runs about Center Command! Sure the graphics are good and the idea is sound, but the game play is awful! Just a monotonous take-the-instruments, take-the-instruments etc. Just you can't even speed things up in between loading to and from islands. I feel that a potentially good game has been marred by lack of thought, on the part of its designers.

Mark Boulton
Kingston-upon-Thames

■ I think you're confusing mixing and sequencing. A sequencer which can be used to play a sequence of notes with specific sounds, tempo etc is rather different from a mixer, which takes the audio outputs from several instruments and integrates them all together for recording or live performance. The former is easily and well handled with an ST or Amiga through MIDI. The latter isn't, and at the time entertainment and of the market the Aminal 4-track is probably not a bad buy.

"Track" and "series" of string have similar lengths—the length of a track depends on the complexity of each note and how many instruments are playing on it.

8000X that you're not really comparing the two. Although the Amiga sound chip is more sophisticated, whether it's worth swapping machines for depends on the importance you attach to sound quality.

Automating VirusX

I wonder if you could please help me: could you please tell me how to get Virus to the startup sequence so that when you boot up your Amiga it is already there to start checking disks? I've looked through the Commodore manual (only to find 10 lines of meaningless information).

Janis Selby
Ripley

■ First, make room on your Workbench area for the Virus program (delete the Demos folder if you like) and copy it into the top-level directory. Type **DO AUTOSTART**—appears to run the last entry (D) and load the

startup sequence file into it. Add the file **DO AUTOSTART** to the end of this file and save the file and exit by pressing **[Esc]**. Reload the machine and Virus will be installed. You will have to remove the CLI window which appears during boot-up though, as the PowerLite doesn't illuminate and the window is left open. The Workbench screen is underneath the open CLI.

Format Français

First I must tell you I am a French student, so I do apologise for the mistakes I will surely make.

I think ST Amiga Format is a really great magazine. The idea of a cover disk is wonderful. ST Amiga Format isn't too hard to understand, and very interesting. That's why I want to ask you this question: what have I to do to get ST Amiga Format in France?

M Chénouet
France

■ Write to our subscriptions

department at The Old Barn, Somerton, Somerset BA11 3PP or ring them on 0458 240311. They'll be happy to quote an overseas subscription rate.

Sallying Forth

Under the "Getting Going" language file is issue 1, whatever happened to Forth? I suppose your choice is formed by whatever sales you read at the time you start, but I got the general impression that "Forth was dead" because:

- a) it's ancient—you can say it's going to work out, debugging as you go along (unlike C, where I understand you don't feel out until the end)
- b) reasonable cool—cheaper than many 8086s and C's (including Pascal that I've seen. Very easy-to-use therefore too. I have 2 marvelous books.
- c) more compact and faster and more elegant than Basic
- d) easier than Assembly
- e) applicable to just about any pro-



poor, fast graphics, robotics etc. Why doesn't everyone use Form? Is there a snag I haven't come to yet? No, don't have to stick to 18 sections, and you can delete - I often run Form as first when I want a calculator quickly, though I have a desk accessory calculator, as the screen's more comfortable to sit on.

It only takes 3 or 4 goes before you have a mental picture of the stack peering up and down in your mind - it's easy! Sorry to go on but don't leave it out of your language features and program listings.

Hanna Whangan
Halswood

Full bag

On which machine (and out of interest were the fonts used for the headings of the pages created, ST or Amiga, or was it another machine to save being accused of bias?)

At the moment I am using a normal TV with my Amn ST386, which is inadequate for art work, as red and blue are very dominant colours, making detail work practically impossible. I would like to get a monitor and wonder why Philips monitors are cheaper than Apple's own, are they less reliable? Which monitor would be the best for graphic work?

Also, I'm thinking of getting a second drive, is the one selling for £199.99 suitable? I want to change the internal drive for a 1 Mb drive, but the ones I have seen have tiny buttons at the right hand side of the drive. The one in the machine at the moment has a big button in the middle and the case is made of wood. Is the question is if I buy an internal drive will it slot straight into the place of the old drive or will I have to cut a hole in the case to fit the drive (not built-in) slot?

I am wondering if it would be worth getting a big upgrade! What will I be able to do with the upgrade? The only advantage I have seen is an A4 package for £1 Meg only - it looks very attractive. Can you tell me of any more advantages of buying an upgrade, so I can tell if it would be worth it.

Adam Mayer
Hilfrees, Liss

■ When a fan list of games! The Amn monitor is rather cheaper than the Philips one though maybe not £100 cheaper, but the Philips ones can be connected to both Amiga and ST, so could serve a double purpose

First, congratulations on your new magazine. It covers both the ST and Amiga without giving preference to one or the other, and with any luck you won't get too many 'My ST is better than your Amiga' letters in the letters page, or if you do, they'll at least be making constructive comments.

Last one major disappointment - no adventure section. We poor adventurers often have to make do with an odd page or two in a magazine but we tend not to write in Format.

I know you had 'Too Brave New World' and a few 'Jander

TIPS OFF

tips in Game Masters, but that's another reason why the writing - the tips are wrong. If you cut the wire, you'll lose luck and won't be able to complete the game, and the clue about the mirror applies to Guild of Thieves, Magister's Double's second adventure.

Don McElroy
Stokeup

■ Rhodope, sorry about the test. Adventure/role playing game coverage is under consideration.

'Next time, we'll try it without the tip.'



should you ever add an Amiga to your stable. The Philips monitors have no particular reliability problems of which we're aware.

If you're going to buy a second drive, why not fit it external? That way you get the extra capacity and have the increased flexibility of a removable machine. An extra half megabyte of memory can be used as a RAM drive, speeding the operation of many packages which make heavy use of disks. Our specs are produced on an Apple Macintosh, as is the rest of every page.

A500 to PC

I am seriously considering purchasing an Amiga for home use, so could you please answer me one burning question. Is PC compatible only possible on the 5080 or is there a suitable package/expansion that will enable PC software to run on a 505? If not why not?

Steven Russell
Port Talbot

■ The 'Transformer' package, bundled with the A500 in Commodore's summer promotion, emulates a PC in software. It costs about £35.00 at discount prices, the intent to cover emulators for both machines is a forthcoming issue.

Price plea

Here in London our nearest stockist is in St. Austell, 100 odd miles away, or it's sending to software houses, with the problem of buying a pig in the poke. In shops you can see what type of game you are buying, so it is important that magazines give a list (picture of game and/or business programs, but please remember just because we have an Amiga, it does not mean we can afford £100-plus for software. However much

it appears, we can only buy three items of software which will not put us in debt for ever and a day.

Mr J.B. Trailing
Bodmin

■ Point taken, but there are plenty of people using both machines professionally, who can. We'll continue to cover software of a wide variety of prices.

It's impossible

Once upon a time, way back nearly nine years ago (well, 1985 actually), I owned a Commodore 64. For that machine, at about the same time, there emerged a game that is in my view at least, remains unparalleled in its high quality. It was the Code Lines of adventures, the best known of fighting, Fantasy, the wacky exploits of Dungeons and Dragons. It was in short, the entire megawatt zones of all equal culture in regards excitement, atmosphere and originality.

The game was part 1 in a series entitled *Alternative Reality* - a US based release distributed by Datacube. If my memory serves me better than my COM 64's did, 'yes, I can recall the first small hours I spent wandering in The City, a world distributed only by the click of cassettes in the Amiga, the hair-raising of the blacksmith and my father snoring in the next room.

So I walked with bated breath for part 2. The Dungeon to arrive. But it was not forthcoming. What happened? Not a word, not even a rumour have I heard since. 'Your mission, ST Amiga Format, should you wish to accept it, is to discover the evil force preventing the release of the remaining 3 titles. Should you or any of your mission reportable software squad fail to report, I'll be very disappointed.

J.B. Trailing
Manchester

■ Having developed all the reviews, using inevitably complete equipment based around engineers, Microsoft's and a Roger Knapton (TM) mark, Format has discovered that MSN: The City is available NOW from Grandlam for £18.95, with AR: The Dungeon following in the new year. For further details, check out the back cover of issue 2 (don't let me know it was that easy - GUL).

On the game

I enjoy programming my computer, as well as playing games. Up to now I have only bought ST BASIC, but I am just starting. Sometimes I want to program a Commodore 64 in both BASIC and machine code. I am 15 years old and was wondering how to start writing games for a long. Will I need to write a good game before I get a chance to sell a software company (like a look at my programming abilities is another way) like, what are my chances of getting a job?

Paul Linney
Stokeup

■ Four best bet, tough though it may be, is to enter a game first. With that you can put your knowledge and skills, so the software houses will have something to look at. If it's a good game, you may start earning royalties from that to fund the next (quite likely) or you may be taken on as a full-time employee (rather less likely).

Strange but true

A point on emulators. You may be interested to know the emulators is capable of playing in 4x. That means it float, and in this way it can load rivers.

Geoff Hutchins
Witchford

ADVERTISERS INDEX

16 Bit Centre	61	Hardware	51
16 Bit Software	61	Hi-Soft	9
17 Bit Software	61	Homework	63
Amiga FD	97	Impact Animation	76
Amiga FD Library	68	Interpretation	31
Amor	23	Lullaberry	44
Athena Consultants	97	Lightspeed	23
BBD Dust Covers	97	Logistics	484C
Byteback	76	Mallsoft	63
Bytewise	23	Molten	67
CBS	93	Mirrorsoft	98
CYS	71	MSB	97
Castle Computers	34	North Note	13
Censtar	63	Ocean	56, 60
Centrix	16	Pygmalion	56
Chips	71	Seller	76
Citi	7	SHC	15
Component	18C	ST Club	66
Computer Adventure World		Stress	25
Computer Trading	76	Soft Staff	62
Computer Writer	93	Softville	92
Cut Price Software	67	TimeSoft	73
Datal	58, 59	Tyresoft	44
Evolution Mirror	16		

DUST COVERS FROM BBD - THE PROFESSIONAL OPTION

Protect your Amiga, or Atari with a dust cover from the BBD Professional Range.

Made from best quality proofed nylon that has been treated with a flame resistant and anti-static inhibitor. BBD Dust Covers are tastefully finished with contrasting piping. They will never crack, discolour, tear or fade. They can be washed and re-used and so confident are BBD of their quality that they give non-refundable guarantee with every cover. BBD covers are not expensive and all our prices include VAT and P & P.

ATARI 520 ST AND 1040 COVER SETS

Complete sets for the keyboard, monitor, disc drive and mouse	
Monochrome Sets	59.50
Colour Sets	68.50
Atari 520 ST/1040	54.50

AMIGA DUST COVER SETS

Amiga 500, Keyboard only	54.50
Amiga 1000, one piece cover	57.50
Amiga 2000, two piece set	59.50

In addition to the above BBD offer a wide range of other covers including printer covers from only £5.00. Why not contact us for further details.

BBD DUST COVERS

The Standish Centre, Cross Street, Standish, Wigan, WMB 9HQ.

Telephone: 0257 - 422968 ext. 33 FAX: 0257-422969



NEWPORT (L.W.) BUSINESS SUPPLIES

31, Pilsy Road, Newport, Isle of Wight. PO14 3JH

3 1/2" DISKS

Pack of 5	£3.25	Pack of 10	£6.45
Prices are Double Sided, Double Density, 135TPI, Guaranteed			

LOCKABLE STORAGE BOXES

40 Capacity	£3.85	80 Capacity	£7.40
-------------------	-------	-------------------	-------

Prices include 4 Disk labels + Postage & Packing + VAT

Cheques/P.O. to **Newport (L.W.) Business Supplies**

3 1/2" GOLDSTAR BRANDED DISKS

In keeping with our policy of dealing only in quality BBD are offering Goldstar Branded D5DD 135tpi disks for £13.95 per box of 10. These disks are 100% error free and carry a life time guarantee.



The Standish Centre,
Cross Street, Standish,
Wigan, WMB 9HQ

Sheer Perfection in Computer Protection
Telephone: 0257 422968 ext. 33 Fax: 0257 422969
Callers and Dealers Enquiries Welcome

• 2 For 1 Guaranteed Disks •

75p

D5/DD
135tpi 3.5"
min qty 10
Boxes of 10
(50p inc)

33p

D5/DD
68tpi 5.25"
min qty 20
Boxes of 20
(16p inc)

All prices + VAT FREE delivery (UK)
0705 511436 (office) • 0329 282063 (24 hr)

0706 511646 (Fax)

Cheques/P.O. to:



Athena Consultants • Media Centre
Dept PCP 16 Stoke Road, Gosport, Hants, PO12 1JD

AMIGA PUBLIC DOMAIN SOFTWARE

Choice selection of English and American discs. Only 50p or £1.00 handling charge per disc.

Send S.A.E. for this month's list to:

A.P.D. UNLIMITED!

57 Hill Park Road, Fareham, Hants PO15 5EW



Winners galore

The closing date for our Eurocon laser competition came and went and 1500 hopefuls had their postcards, envelopes, lots of cardboard and cassette records thrown into the mighty format binoculars drum. We were surprised more people hadn't discovered the right answers, which were A - Desk for Publishing, B - By depositing toner and C - The UQ 250. Roughly one in three entrants knew the right answers, with many people convinced the post sample was from the laser printer.

The first two correct answers out of the drum were R. Ebbot of

Ami ou ennemi ?

I guess we should thank computer lucky Commodore (it) have been very helpful to us during and since the launch of Format. This would not seem to be the case with magazines across the channel - a rather oddball Stuart Ledger, editor of the new French magazine *Anews*, attacked the trouble his mag has had with Commodore France.

It seems that the new magazine is not focused

by Frank Laine, French boss of Commodore, who feels the market is as yet 'too young' for a dedicated image mag. Laine has lost the weight of Commodore behind a real publication, and when he was unable to stop *Anews*, he withdrew his company's press service for press releases and product announcements and forbade them to use the words *Amiga*, *Rockwell* or *Workbench* on their front cover. This resulted in the rather peculiar cover line reproduced on this page.

We wish *Anews* well and hope they soon sort out their differences with Commodore. The company's approach seems an oddly negative way of publishing a mag.



Cochester in Essex (who won the £20500) and R. P. Alou, of Belling in Northamptonshire the £10500.

The second competition in issue 1 was to design up the real missing behind *Anews*'s strangely named (WOL) command in *Protext*. The two winners, are A. Mason of Leicester for 'Question that are fact, Contents of Locations' and Trevor Cable of Leeds for 'Quick with local in Computer Library'.

And finally the results of the *Price Questionnaire* quiz: there were over 600 returned, for which many thanks, and the first five listed from the top were Mark Niles of Bedford, Paul Luskford of Harlow, Paul McKillop of Doncaster, Anthony Twell of Stourbridge and Colin Brown of Perth. 42% software vouchers will find their way to you as soon as we've printed them.



■ Culture Prizes recently ran a competition for schools in collaboration with the newly released Word Wise - Food for Thought (on the World Wildlife Fund), with the prizes going to projects on dental health and the ecology of wetland playing fields. Unfortunately, being a very hot day, a painting easel at the prizegiving seems to have mistaken Kate Luskford for an ice cream.

SPAMIGA

Issue 4 of ST Amiga Format hits the streets on Thursday 15th September - order yours now, you know it makes sense.

Superheroes, Inc.

by Sarfar



Cut the cost Cut the hassle Cut the coupon!

Compumart

A SMALL TOWN SHOP IN THE MIDDLE OF THE WORLD

AMIGA

3.5" Disks and
Storage Box
Information included
in this pack,
please send for
details.

DEPARTMENT 54F
JUBILEE DRIVE
LOUGHBOROUGH
LEICS LE11 0XS
TEL: 0509-810444
FAX: 0509-810235

Send Now for your **Free** copy of the Compumart ST Information Pack
and discover a full range of ST Accessories at Super Low Prices . . .

For IMMEDIATE RESPONSE, simply send the coupon to
Compumart, Freeport, Loughborough LE11 0XS

Please tick one

Is this Compumart ST Information Pack
I require intended for an AMIGA ☐ ATARI ST ☐

Name

Address

Postcode

Date

STARRAY



Starry Ships
reduce from
£24.95 to
£14.95

We won't mention the super-smooth parallax scrolling...the stunning backdrops...the amazing hi-res graphics...the never heard before sounds...the gameplay that turns humans into jelly...the aliens that just get wierder...the unique Last Game Option

We'll just say "Quite possibly the best arcade action yet written for any micro"

AMIGA STARRAY CONTAINS 2 DISKS AND AN AUDIO CASSETTE FOR £24.95. CHEAPER, AGAIN FOR THE ATARI ST AND COMPATIBLE 44 AT £19.95 AND PC FOR £26.95



"This game is so hot it will leave burnmarks on the most adept joysticks"

Amiga User International



Phone your order now on our credit card hotline for prompt delivery (0930 12003)

LOGOTRON
RECREATION

MASTERWORKS FOR THE MILLENIUM

LOGOTRON LTD, DALES BREWERY, GWYDIER STREET, CAMBRIDGE, CB1 2LJ